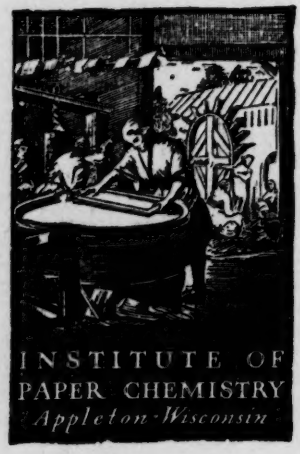
Pages 599-690

# BULLETIN

OF

# THE INSTITUTE OF PAPER CHEMISTRY




AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

# LIBRARY NOTES

APRIL • 1954
Volume 24 Number 8

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# Books and Pamphlets Added to the Library During March

### BIOGRAPHY

WHO'S WHO in America; a biographical dictionary of notable living men and women. Rev. and reissued biennually. Chicago, Marquis-Who's Who [c1954] v. 28, 1953-54. 3370 p.

### BOTANY—ECOLOGY

DAUBENMIRE, R. F. Plants and environment; a textbook of plant autecology. New York, Wiley [c1947; third printing, 1950] 424 p.

### EDUCATION, HIGHER

STORR, RICHARD J. The beginnings of graduate education in America. [Chicago] Univ. of Chicago Press [c1953] 195 p.

### GENETICS

DOBZHANSKY, THEODOSIUS. Genetics and the origin of species. 3d ed. rev. New York, Columbia Univ. Press, 1951. 364 p.

### GREENHOUSES

CHABOT, ERNEST. Greenhouse gardening for everyone. New York, M. Barrows and Company [c1946; fifth printing, 1950] 266 p.

### HANDICRAFT

HUGHES, G. BERNARD. Living crafts. New York, Philosophical Library [1954] 192 p.

In a review of 20 ancient and honorable crafts still practiced in Great Britain today, one brief chapter each is devoted to the papermaker, paper marbler, and (animal) parchment maker.

### HYBRIDIZATION, VEGETABLE

ANDERSON, EDGAR. Introgressive hybridization. New York, Wiley [c1949] 109 p.

### LIGNIN

HACHIHAMA, YOSHIKAZU, and JYODAI, SYO. Chemistry of lignin. Printed in Japan, 1947. [In Japanese] 735 p.

### MAPS

SPECIAL LIBRARIES ASSOCIATION. *Map Resources Committee.*

Map collections in the United States and Canada; a directory. Marie Cleckner Goodman, chairman. New York, The Association, c1954. 352 p.

### PAPER MAKING AND TRADE

CROWN ZELLERBACH CORPORATION. Making paper. 3d ed., ed. by A. G. Natwick, P. Luch [and] J. T. Hallock. San Francisco, Crown Zellerbach Paper School of Crown Zellerbach Corp., c1953. 702 p.

### PEROXIDES

TOBOLSKY, ARTHUR V., and MESROBIAN, ROBERT B. Organic peroxides, their chemistry, decomposition, and role in polymerization. New York, Interscience Publishers, 1954. 197 p.

### PLANTS—EVOLUTION

STEBBINS, G. LEDYARD, JR. Variation and evolution in plants. New York, Columbia Univ. Press [c1950; second printing, 1951] 643 p.

### PLANTS, CULTIVATED

BAILEY, L. H. Manual of cultivated plants most commonly grown in the United States and Canada. Rev. ed., completely restudied. New York, Macmillan, 1949. 1116 p.

### PLASTIC MATERIALS

STANNETT, VIVIAN. Cellulose acetate plastics. London, Temple Press [1950] 325 p.

### SCIENCE—HISTORY

HALL, COURTNEY ROBERT. History of American industrial science. New York, Library Publishers [c1954] 453 p.

### SOLVENTS—TOXICOLOGY

BROWNING, ETHEL. Toxicity of industrial organic solvents, revised in consultation with the Toxicology Committee. [Rev. Am. ed.] New York, Chem. Publ. Co., 1953. 411 p.

### TRANSDUCERS

KRETT, DAVID B., comp. Transducers, a compilation useful primarily in oscillography. 2d ed. Clifton, N.J., Allen B Du Mont Laboratories [c1953] 151 p.

# Survey of Periodical Articles

*The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.*

## ADHESIVES

REINHART, FRANK W. Nature of adhesion. J. Chem. Educ. 31, no. 3: 128-32 (March, 1954).

Adhesion is attributed to the forces of attraction between atoms and molecules, namely, electrostatic, covalent, and metallic bonds, and secondary or van der Waals forces. Secondary forces are probably responsible for most cases of adhesion, although the others are also operative in certain specific systems. These forces of attraction are operative to the extent that molecular nearness between adhesive and adherend is attained. This requires that the adhesive become liquid at some point or that it be synthesized in contact with the adherend. Changes in volume which arise from changes from the liquid to the solid state, changes in temperature, changes in composition, or changes on aging result in the development of stresses. The magnitude of these stresses is dependent on the moduli of elasticity, the flow, the ratio of the coefficients of thermal expansion of the adhesive and adherend, and the topography of the adherend surface. The strength of any particular system is thus dependent on the nature of the adhesive and adherend, the surface characteristics, the physical properties of the components, and the design of the joint. A diagram is given to show the interrelations among the various factors involved in adhesive bonds. The factors discussed by various authors who have written on the theory or nature of adhesion can be placed in proper perspective by means of the diagram given. Each idea advanced to date is concerned with those properties of most importance in the particular system studied. This may account for the lack of universal acceptance of any one author's theory of adhesion. 1 table, 1 figure, and 11 references. E.S.

## AIR CONDITIONING

LATHAM, CHARLES W. Air conditioning. Am. Printer 135, no. 3: 36-7, 67-8 (March, 1954).

The action of high humidity on paper, inks, and plates and in stripping, photography, finishing, and storage operations is the cause of numerous problems in printing; air conditioning is viewed as the solution. R.A.S.

## ALKALINE PROCESSES—FURNACES

ANON. New Longview recovery unit takes load of 5 machines. Pulp & Paper 28, no. 3: 70, 72 (March, 1954).

A new No. 14 Combustion Engineering recovery boiler at Longview Fibre Co., Longview, Wash. went into operation in November, 1953. It is designed to handle 1,050,000 pounds of dry solids/day, with a steam flow of 165,000 pounds/hour. The black liquor from the multiple-effect evaporators passes through the wet bottom of a Research Corp. electrostatic precipitator to the two-drum cascade evaporator. The 55%-solids liquor is evaporated to 65-67% solids and sprayed at low pressure through the six furnace spray nozzles. A water-cooled furnace bottom utilizes a smelt pool to protect the hearth. 2 illustrations. E.S.

## ASSOCIATIONS

AMERICAN PAPER AND PULP ASSOCIATION. Summary of 1953 activities of the American Paper and Pulp Association. Southern Pulp Paper Mfr. 17, no. 3: 66, 68, 70-1 (March, 1954); Paper Trade J. 138, no. 9: 59, 61-2, 106, 108, 110-12, 114 (Feb. 26, 1954); Paper Mill News 77, no. 8: 116, 118, 120, 123-4, 126 (Feb. 20, 1954); *cf.* B.I.P.C. 23: 538.

Summaries of the major projects are presented in the following committee reports of the American Paper and Pulp Association: Traffic Committee, Community Relations, Industrial Relations, Water Resources, Forest Policy, Export Committee, Materials Committee, Controllers Committee, Statistical Committee, Technical Committee, Co-ordination of Research, Biological Control Committee, Instrumentation Research, and Classification and Definitions. E.S.

BAILEY, W. J. Attitude of pulp and paper industry to its conservation program. Southern Pulp Paper Mfr. 17, no. 3: 40, 42 (March, 1954).

The pulp and paper industry can measure the value of the work of the Southern Pulpwood Conservation Association by examining statistics which show for each succeeding year a greater quantity of pulpwood removed from the lands of private owners in the higher categories of approved cutting practices. In addition to this emphasis on conservation for small landowners, other projects are the utilization of sawmill and other wood wastes, maximum production, and the conversion of hardwood lands into pine lands. R.A.S.

KNOWLTON, DAVID C. Pulp Consumers Association. Paper Mill News 77, no. 8: 111, 162 (Feb. 20, 1954).

The author reviews the activities of the association during 1953, presents statistical information on market pulp consumed, and lists meetings scheduled for 1954. R.A.S.

MACDONALD, R. G. Report of the Secretary. Tappi 37, no. 3: 74A, 76A, 78A, 80A, 82A, 86A (March, 1953); Paper Mill News 77, no. 8: 91-2, 94 (Feb. 20, 1954). [Abridgment] *cf.* B.I.P.C. 23: 538.

The annual report for 1953 of the executive secretary of the Technical Association of the Pulp and Paper Industry is presented, covering membership, necrology, meetings and conferences, publications, TAPPI medal award, employment, research projects, local sections, and divisions and committees. R.A.S.

## BALSAM FIR

ROE, EUGENE I. Forest Research Center studies growing balsam pulpwood. Lake States Timber Dig. 7, no. 10: 5, 8 (March, 1954).

The Lake States Forest Experiment Station at Grand Rapids, Minn. is studying the growing of balsam fir to alleviate the increasing scarcity of spruce pulpwood. The studies include handling of the stands, usually mixed with aspen and birch, and cutting and thinning practices. R.A.S.

## BAMBOO

SINEATH, H. H., and DAUGHERTY, P. M. Bamboo; plant with a future. Chemurgic Dig. 13, no. 2: 9-10, 17 (February, 1954).

The successful use of bamboo in several countries as a paper-pulp source would indicate that bamboo might be an answer to the increasing need for an additional pulp source in the United States. The yield of cellulose material per acre per year from bamboo could be six or seven times that from pine. Various other uses for bamboo are described; experimental work is currently being conducted. 1 illustration. R.A.S.

## BARK

JENSEN, WALDEMAR, and RINNE, PEKKA. Studies on suberin. VI. Isolation and constitution of phloionolic acid from the suberins of *Betula verrucosa* and *Quercus suber*. Paper and Timber (Finland) 36, no. 2: 32-4 (February, 1954). [In English] *cf.* B.I.P.C. 24: 431.

In the suberin of *Betula verrucosa*, phloionolic acid (I) (whose methyl ester melts at 77.3-78.5°C.) is present in much larger amounts than is phloionic acid. Just the reverse of this is true for the corky layer of *Quercus suber*. In either case (I) was shown to be 9,10,18-trihydroxy stearic acid, thus substantiating the work of Zetzsche and Weber (*cf.* J. prakt. Chem. 150: 140-4 [1938]). Proof of the structure of (I) is given, and the methods of isolation are outlined. 6 references. L.E.W.

## BARKERS AND BARKING

IMPROVED MACHINERY INC., *Nashua, N.H.* New barker undergoing tests. Paper Ind. 35, no. 12: 1324-5 (March, 1954).

The Impco barker, a redesigned Sund machine developed in Sweden, is described; it will handle 4- and 5-foot pulpwood bolts of a diameter between 4-16 inches. Bark removal is accomplished by feeding a bolt through the center of a rotating ring on which are mounted six powerful springs which exert the pressure. 4 illustrations. E.S.

PUTKISTO, KALLE. Latest achievements in mechanical barking in forests and at storage-sites. Finnish Paper and Timber 4, no. 10: 117-20, 122 (1953). [In English]

The author discusses the requirements of portable barking machines for Finnish conditions; several Finnish (Jätkä, Parkko, Valo) and Swedish (Mira, Skoglund) constructions are described. In conclusion, a brief reference is made to a new mill barker (IKR) built by Valmet Oy. Pulpwood logs cut to standard measurements are rubbed against one another in a specially constructed basin or pocket the bottom of which consists of rotating rollers; the logs rotate as a unit and each log individually. The loosened bark is washed out with water jets. 11 figures. E.S.

## BARKERS AND BARKING—CHEMICAL

ANON. Improved pulpwood peeling. Pulp Paper Mag. Can. 55, no. 2: 57 (February, 1954).

Alexander R. White is the discoverer and developer of the chemical debarking process for which he obtained Canadian patent 407,221 on Sept. 8, 1942 and U. S. patent 2,324,968 on July 20, 1943. Seventeen Canadian

companies in the pulp and paper field have bought and donated to the Canadian public the Canadian patented process together with any rights emanating in the future from it. The U. S. patent rights were bought in 1952 by Armstrong Forest Products of Johnsonburg, Pa.; the company dedicated them to the public of the United States. E.S.

## BEATING

NEDERVEEN, G. VAN, and Isings, J. Phase contrast microscopy of beaten pulp. Tappi 37, no. 3: 103-9 (March, 1954); *cf.* B.I.P.C. 23: 870-1.

Phase-contrast micrographs of pulps from rags, softwood sulfite, hardwood, and bleached straw, beaten in a laboratory Hollander, a Lampén mill, and a Turmix, are presented. Rag fibers when beaten are found to give only one-dimensional fibrils. Beating of wood and straw pulps causes principally the disintegration of the cell-wall material, resulting in skins which on a nearer inspection consist of linear fibrils still exhibiting a lateral cohesion. In some cases fibrils apart from the skins were observed. These proved to be "rolled-up" skins. Consequently the lateral fibrillar cohesion of rag fibers seems to be less strong than that of wood and straw-pulp fibers. 20 micrographs and 3 references E.S.

WIJNMAN, C. F. Influence of heavy beating of cotton fibers on molecule length and crystallinity. Tappi 37, no. 3: 96-8 (March, 1954).

When purified cotton fibers are subjected to heavy beating in a Jokro mill, a large decrease of the cellulose D.P. can be observed, accompanied by a moderate reduction in the average size of the crystalline regions and a small reduction in the total crystalline portion. On the other hand, when dry cotton is ground to a fine powder, most of the crystalline portion will be destroyed. 1 table, 5 figures, and 24 references. E.S.

## BIOGRAPHY

STEPHENSON, J. NEWELL. Abitibi's alumni. Pulp Paper Mag. Can. 55, no. 2: 48-55; addendum: no. 5: 75 (February, April, 1954).

In answer to a questionnaire sent to a group of men who worked in the Technical Service Division at the Iroquois Falls mill of Abitibi during the twenties, particularly "under the rule of Laird McInnis," biographical data were assembled telling about the men's activities at the mill and since then. The history of the start and fate of the mill is interwoven in these stories. 4 illustrations. E.S.

## BLACK LIQUOR—OXIDATION

TÄHTINEN, MIKKO. Observations and experiences in the oxidation of black liquor. Paper and Timber (Finland) 36, no. 2: 35-44 (February, 1954). [In Finnish; English summary]

Following a brief review of the reasons which have led to the development of black liquor oxidation (I) and of the pertinent literature in the field, the influence of (I) on the heat economy in alkaline recovery and its advantages and disadvantages are discussed. In 1952, the first (I) installation in Finland was completed at Oulu Osakeyhtiö. This plant was designed by Bergström-Trobeck; the layout of the plant and data and experiences from the operation are reported, including a discussion of the influence of the strength of the black liquor on the degree of oxidation. The plant at Oulu

does not yet work satisfactorily. This is apparently due to the greater than usual foaming tendency of the liquor; the foam-breaking capacity is obviously not sufficient. At present research work and experiments to improve the equipment are under way. 1 table, 4 figures, and 10 references. E.S.

### BLEACHING

ANON. Sodium hypochlorite—the easy way. Chem. Eng. 61, no. 3: 128, 130 (March, 1954).

Mathieson's batch, continuous single-pass, and continuous circulating processes of producing sodium hypochlorite are outlined briefly. The continuous systems have several advantages, such as saving in plant space, automatic control, and greater stability and uniformity of the product. The previous belief that the stability of bleach liquor increases with the amount of residual caustic soda has been found to be incorrect. Investigational work indicates that there is an optimum excess; for instance, a 16% solution of sodium hypochlorite will attain maximum stability with an excess caustic concentration of about 4 grams/liter. A faster rate of bleaching in pulp and textile applications is obtained with a bleach liquor containing a minimum excess of caustic. 3 illustrations. E.S.

### BOARD

ALFORD, JOHN C. Comparison of British and American board mill operations. Pulp Paper Mag. Can. 55, no. 3: 179-80 (Convention issue, 1954); Paper Trade J. 138, no. 15: 14-15 (April 9, 1954).

The author describes the difficulties of the British boardmaker caused by lack of native pulp, chronic waste paper and frequent fuel shortages, high humidity, and continued high demand as compared with supply. Production rates and uniformity of product are excellent; however, quality is much below American standards. E. S.

### BOARD—CONVERSION

ANON. Gairs' newest plant at Teterboro. Fibre Containers 39, no. 2: 36, 38, 40, 45-6 (February, 1954).

The corrugated box plant of Robert Gair Company, Inc. at Teterboro, N.J. is described; the plant, which was completed early in 1952, produces single- or double-wall corrugated board with different flute combinations from roll stock shipped from company plants at Port Wentworth, Ga. and New London, Conn. The solid-fiber equipment from the company's Bogota, N.J. plant is also being moved to Teterboro to consolidate box-fabricating operations. Machinery at the new plant includes an 85-inch Langston corrugator, two hood and exhaust units, an automatic sequence-control system for the slitter-scorer unit and the two cut-off stations, an S&S automatic folder-taper and three Universal semiautomatic tapers, and three Bostitch 485B semiautomatic stitchers. 26 illustrations. R.A.S.

### BOARD—DEFECTS

WILSON, R. L. How to eliminate curling in the manufacture of paperboard. Paper Trade J. 138, no. 13: 24 (March 26, 1954).

Care taken in assuring that pick-up at water boxes is the same for both liners, additional precaution in balancing furnishes so both liners will absorb the same amount of moisture, and attention paid to temperature and humidity during transit and storage will reduce curling tendencies of paperboard. R.A.S.

### BOARD—STATISTICS

ANON. Commodity report; fiberboards. Unasylva 8, no. 1: 21-5 (March, 1954); *cf.* B.I.P.C. 21: 153-4.

Since 1950 the market for fiber building boards has fluctuated considerably; in the peak production year of 1951, production amounted to 2,475,000 metric tons. Of this total, 75% was produced by Finland, Norway, Sweden, Canada, and the U. S.; the three European countries accounted for 275,000 tons or 72% of the total world exports. In 1952, the recession year, this export total dropped to 166,000 tons; for the most part production elsewhere was maintained at about the same level. Capacity for 1953 is approximated at a new high, 3,005,000 tons, of which the U. S. accounts for 1,300,000 tons, followed by Sweden with 430,000, and Canada with 200,000 tons. Sweden consistently accounts for most of the exports; the United Kingdom leads in imports. The per capita consumption of fiberboard in kilograms for 1952/53 was 20 in Sweden, 11 in Canada, and 8 in Finland and the U. S. Hardboard production during and since the war has expanded much more rapidly than that of insulating board. New applications for both commodities are daily being discovered and are expected to bring marked changes in the end-use pattern of the industry's output. 5 tables. R.A.S.

### BOARD, ASBESTOS

OSE,—. Corrugated board from asbestos and piping insulation. Allgem. Papier-Rundschau no. 3: 93 (Feb. 5, 1954). [In German] *cf.* B.I.P.C. 24: 176-7.

There are five firms in the United States which manufacture corrugated asbestos board; the principal portion of the output is converted to pipe insulation (I). The manufacture of the board and its conversion to (I) are outlined briefly. Reference is made to U. S. patent 2,224,810, granted to Cumfer on Dec. 10, 1940, which covers the helical winding of asbestos-board strips into a tubular structure by a continuous machine operation. E.S.

### BOARD, BUILDING

ANON. Raw materials for wallboard; experiments with agricultural and wood working residues. World's Paper Trade Rev. 141, no. 8: 587-8, 590 (Feb. 25, 1954).

In answer to an inquiry by an Italian firm on technical processes for making framings for dwellings using residues from the dairy industry and grape and vine pressings, wood waste, and agricultural wastes, the Mutual Security Agency described briefly the use of casein, wood waste, and agricultural residues (straw, bagasse, rice hulls, peanut hulls, etc.). No information on the use of grape or olive pressings was available. 4 references. E.S.

### BOARD, CORRUGATED

SCHOENBERG, WILLIAM. Moisture problems in corrugating operations. Parts 1-6. Fibre Containers 38, no. 7: 60, 62-6, 68-9; no. 9: 77-8, 80-4; no. 10: 78, 82-92; no. 11: 84-90 (July, September-November, 1953); 39, no. 1: 70-1, 74-5, 77-9; no. 2: 80-7 (January, February, 1954).

The author discusses moisture problems in the manufacture of corrugated board and shows that every characteristic of the paperboard used, every step

in the combining and finishing operations, and every property of the fabricated box is affected by moisture. As the percentage of moisture present varies, so will the test results vary. Methods and techniques by which moisture control can be effected with the aid of instrumentation and the correct way of introducing instruments, one at a time, to the operator are outlined. Data are included on the amounts of water to be evaporated from components with different moisture percentages, B.t.u. requirements and comparative costs, moisture pickup from adhesive, moisture variations in roll stock, removal of moisture vapor during various stages of the corrugating operations, exhaust systems, quality control programs established by users of boxes (including minimum standards), the wet-streak problem and its effect on adhesion, corrective methods, loose edges, and viscosity of adhesive. 8 tables, 12 figures, and 7 references. E.S.

## BOARD MILLS

ANON. New Oregon Fibre Products, Inc. fibreboard plant at Pilot Rock, Oregon starts production. Paper Mill News 77, no. 13: 3 (March 27, 1954).

The plant will produce a complete line of hardboard, structural insulation board, decorative boards, and acoustical tiles from bark-free ponderosa pine chips supplied by associated industries and neighboring sawmills. The chips are processed through Bauer rapid-cycle digesters and attrition mills, washed, and formed into a continuous sheet on a Downingtown Fourdrinier machine. After drying in a Coe drier, the board is cut to size and converted into insulation-board products. Hardboard is prepared in a similar manner and, after trimming to size, pressed in a hydraulic press, followed by special after treatments. The plant is designed for ready expansion to twice its initial capacity; this will require the logging of lodgepole pine stands in this area. The water supply of the plant is derived from the company's own deep wells. E.S.

ANON. Newest patterns in continuous pulping being set by American Box Board Co. Paper Trade J. 138, no. 10: 14-18, 21-2, 24, 26 (March 5, 1954); *cf.* B.I.P.C. 21: 344.

A description of the continuous semichemical pulp mill of American Box Board Co. at Filer City, Mich. is presented; the mill produces 9-point corrugating medium from aspen pulpwood. Recent improvements and expansion include a two-phase expansion of the power plant, modernization of the woodyard and woodroom equipment, reconditioning of the No. 1 paper machine and existing three stationary digester pulp mill, extension of mill-waste disposal facilities, and the recently completed integration of a new semichemical continuous pulp mill and a new No. 2 Fourdrinier paper machine with auxiliary equipment. The new pulp mill is equipped with two Chemi-Pulper continuous digesters, two Pandia dischargers, and a Hofft blow tank. The No. 2 machine, a Black-Clawson Fourdrinier, is described in detail; a number of innovations were incorporated into the double-decked drier section. 1 flowsheet and 9 illustrations. R.A.S.

## BOARD SIZING

BIRCHARD, W. H. Colloid chemistry applied to board-making. Pulp Paper Mag. Can. 55, no. 3: 244-6 (Convention issue, 1954).

Stating that the entire pulp- and papermaking process is colloidal in nature, the author discusses the sizing, dyeing, and filling of board in the beater from the colloid-chemical angle. The principal part of the discussion is de-

voted to the application of alum and the rosin-size emulsion. The fact is mentioned that stock is easier to size in a wooden than an iron tub, because the iron shell in contact with an electrolyte will set up a cell which will neutralize the charge on the rosin particles and cause preprecipitation of the rosin. Since rosin is a very stable emulsion, the sizing may not be completely ruined; however, with a sensitive emulsion, like latex, additional stabilizers must be used when sizing is carried out in an iron beater. E.S.

## BOARD SPECIALTIES

THE ADDISON-SEMMES CORPORATION, *Racine, Wis.* The U-Mak-It (square post) pallet. Fibre Containers 39, no. 2: 76, 78-9 (February, 1954).

The company's new patented U-Mak-It square-post pallet is described; it consists of properly scored sheets of double-face or double-wall corrugated board (for the posts) and the decks, both of which are shipped flat. The user sets up the posts, secures them suitably, applies adhesive, and builds up two-deck pallets. Advantages in the use of these pallets are pointed out. 1 table and 10 illustrations. R.A.S.

ANON. Fruit and vegetable baskets. Paper Sales 14, no. 3: 24 (March, 1954); *cf.* B.I.P.C. 24: 355.

A similar description of the Andre Paper Box Co.'s new Pak-A-Long paperboard fruit basket as in the previous reference is presented. 3 illustrations. R.A.S.

## BOOKBINDING

LEWIS, ROY. Paperbacks. Bowater Papers no. 3: 54-62 (1954).

Recent developments in book publishing show the ever-increasing trend to the modern inexpensive paperbacked books. The wide variation in literature available in these editions is discussed. Numerous illustrations. R.A.S.

## BUSINESS CONDITIONS

JOHNSON, ARNO H. How to sell 10% more in 1954-55. Paper Mill News 77, no. 10: 13 (March 6, 1954).

The possibility of a business recession, facts which point to an increase in sales opportunities, the present high purchasing power of the consumer, and big business assets are discussed. R.A.S.

MEACHAM, HARRY M. Management looks at 1954. Paper & Twine J. 27, no. 12: 13, 24-7 (February, 1954).

The author discusses problems which management is expected to encounter in 1954, anticipated as the second or third best year in the history of the pulp and paper industry. The economic climate of business, a transition from a sellers to a buyers market, and the level of top management are considered. R.A.S.

## CELLOPHANE

SWEC, LEONARD F., and SULLIVAN, GEORGE H. Polyethylene-coated cellophane. Modern Packaging 27, no. 7: 203-8, 294, 296, 299-300, 304 (March, 1954).

The outstanding properties of both films are combined in polyethylene-

coated cellophane (I), produced by extruding a hot film of polyethylene and immediately combining it to the traveling web of cellophane film by means of heat and pressure. The physical properties, water-vapor resistance, chemical resistance, and economics of four grades of Polycel (trade name of H. P. Smith Paper Co.) and the two original films are compared. Bags made of (I) are formed with the polyethylene on the inside and sealed in different ways, but always with polyethylene to polyethylene. Applications and typical packaging uses of (I) and the properties made use of are discussed. 5 tables and 7 figures. R.A.S.

## CELLULOSE

HEMPEL, KAZIMIERZ. Cellulose structure in the light of recent investigations. Przeglad Papierniczy 9, no. 9: 267-71; no. 10: 308-14 (September, October, 1953). [In Polish; Russian and English summaries]

For abstract *cf.* C.A. 48, no. 5: 3025 (March 10, 1954). 4 tables, 26 figures, and 35 references. E.S.

NEVELL, T. P. Cellulose and cellulose derivatives—chemistry. Rev. Textile Progr. 4: 36-59 (1952) *cf.* B.I.P.C. 23: 543.

The structure, preparation and properties of derivatives, and chemical degradation and modification of cellulose and its derivatives are covered in this review of progress during 1952. 150 references. R.A.S.

ROSCHIER, R. H., and ESKOLA, KAI. On the hydroxoanionic compounds of cellulose. III. Paper and Timber (Finland) 36, no. 2: 27-30 (February, 1954). [In English] *cf.* B.I.P.C. 23: 790.

Tetrahydroxo-antimonite combines with cellulose relatively rapidly, immediately precipitating β- and γ-celluloses from alkaline solution. The adsorption equilibrium, well over toward the liquid phase, does not follow Langmuir's isotherm. The bond with cellulose is very weak. Hexahydroantimonate does not combine with cellulose. 2 tables, 2 figures, and 5 references. K.W.,Jr.

## CELLULOSE—HEMICELLULOSE

WHISTLER, ROY L., CONRAD, H. E., and HOUGH, L. 2-*O*-(4-*O*-Methyl-α-D-glucopyranosyluronic acid)-D-xylose from hemicellulose-B of corn cob. J. Am. Chem. Soc. 76, no. 6: 1668-70 (March 20, 1954); *cf.* B.I.P.C. 24: 183-4.

Partial acid hydrolysis of hemicellulose-B produces a mixture of monosaccharides and oligosaccharides. The latter contain D-xylose units and uronic acid units. On separation of these acidic oligosaccharides there are obtained an aldotriouronic acid, three aldobiouronic acids (structure not yet established), and a fourth aldobiouronic acid which is shown to be a 2-*O*-(4-*O*-methyl-α-D-glucopyranosyluronic acid)-D-xylose. 4 tables and 30 footnotes. E.S.

## CELLULOSE—HOLOCELLULOSE

DEISSENBERG, C., SANGENIS, S., and BOURIT, J. P. Comparative study of methods used in the preparation of holocellulose from wheat straw. Assoc. tech. ind. papetière, Bull. no. 1: 14-20 (1954). [In French]

The chlorite procedure of Wise and co-workers (I) (*cf.* B.I.P.C. 16: 223-4) proved more satisfactory in isolating wheat straw holocellulose (II) than did the Timell-Jahn modification (III) (*cf.* B.I.P.C. 22: 398) of the Ritter-Van Beckum method. (I) was best carried out at pH 4.5 and 55-70°C., thus giving higher (II) yields than did (III); (II) by method (I) also had a higher average D.P. than that formed by (III). 8 tables, 9 figures, and 5 references. L.E.W.

## CELLULOSE—OXYCELLULOSE

HEAD, FRANK S. H., and HUGHES, G. The oxidation of cellobiose by periodate. J. Chem. Soc.: 603-6 (February, 1954).

Considerable interest attaches to the action of periodate on the reducing terminal glucose units in the chain molecules of cellulose; for example, it has been suggested by Head (*cf.* B.I.P.C. 23: 792) that the "overoxidation" which accompanies the normal Malaprade oxidation of cellulose is partly due to progressive attack on the chain molecules from their reducing ends. It was thought that this question might be illuminated by an investigation of the action of periodate on cellobiose, the molecule of which may be regarded as a combination of the terminal glucose units of a cellulose chain molecule. The oxidation of cellobiose by sodium metaperiodate has been studied. Analysis of the results suggests that the sugar is oxidized rapidly to an intermediate product with the structure of a formic ester in the reducing unit, and that the subsequent oxidation is slow because its rate is determined by the rate of the hydrolysis of this ester. The complete oxidation of cellobiose to simple products of this type makes it seem probable that the effect of periodate on cellulose will include a step-wise degradation proceeding from the terminal reducing units. 2 diagrams. E.S.

LINDBERG, BENGT, and THEANDER, OLOF. Quantitative determination of carbonyl groups in oxycellulose by means of sodium borohydride. Svensk Papperstidn. 57, no. 3: 83-5 (Feb. 15, 1954). [In English]

The sodium borohydride method (*cf.* B.I.P.C. 22: 485) has been applied to the analysis of periodate oxycellulose. The value for carbonyl groups was found to be 4% lower than that calculated from the consumption of periodate. This difference may at least partly be explained by the presence of carbonyl groups in the original cellulose and by overoxidation. The general application of the method to the determination of carbonyl groups in oxidized polysaccharides (i.e., technical oxycellulose) is considered feasible and justified. 2 tables, 1 figure, and 5 references. E.S.

## CELLULOSE—RADIOACTIVE EXPERIMENTS

MINOR, FRANCIS W., GREATHOUSE, GLENN A., SHIRK, HAROLD G., SCHWARTZ, ANTHONY M., and HARRIS, MILTON. Biosynthesis of $C^{14}$-specifically labeled cellulose by *Acetobacter xylinum*. I. From D-glucose-1-$C^{14}$ with and without ethanol. J. Am. Chem. Soc. 76, no. 6: 1658-61 (March 20, 1954).

$C^{14}$-specifically labeled cellulose was biosynthesized by *Acetobacter xylinum* from D-glucose-1-$C^{14}$ as the sole labeled carbon source. The presence of ethanol in the medium increased the yield and the quantity of $C^{14}$ found in the cellulose. The distribution of $C^{14}$ in D-glucose from the bacterial cellulose hydrolyzate indicated that approximately 82% of the activity was in position 1 for the cellulose produced from D-glucose-1-$C^{14}$ in the ethanol-free medium compared with 70% in that position for the cellulose produced with ethanol

present. Positions 3 and 4 contained the remainder of the activity in approximately equal amounts. The cellulose had a lower specific radioactivity than the D-glucose-1-$C^{14}$ that was supplied. This result shows that some of the original hexose units are cleaved prior to cellulose formation. Thus, polymerization of the D-glucose as such, without prior chain cleavage, is not the sole mechanism of cellulose biosynthesis by this bacterium. 4 tables and 25 footnotes. E.S.

## CELLULOSE ESTERS—NITROCELLULOSE

CHÉRUBIN, GILBERT. The nitration of cotton linters. Bull. soc. chim. France no. 2: 192-5 (February, 1954). [In French]

Nitration of cellulose is so rapid that the reaction is usually considered permutoid, but this study of cellulose nitrates of low nitrogen content (2.5-11.7%) is interpreted as evidence of a topochemical reaction in this region. The cellulose nitrate can be separated by acetone into a soluble and an insoluble portion; the soluble portion has about 10 times the nitrogen content of the insoluble. If the cellulose nitrate is subjected to hydrolysis before fractionation, the nitrogen content is reduced in the insoluble residue to practically nil. This is considered as the "crystalline" region and the soluble portion as "amorphous." Using 11% nitric acid, 74% sulfuric acid, and 15% water, there is a slow reaction, and samples were taken from this nitrate at various reaction times for this study. The "amorphous" region for the linters studied is around 40% by this method. This is better called the "accessible" region to the nitration acid used. The results vary with the acid; for instance, reactions in the swelling range (37% nitric acid, 34% sulfuric acid, and 29% water) are homogeneous. 5 tables, 2 figures, and 11 references. K.W.,Jr.

## CHEMICAL TESTING—CELLULOSE

BJÖRKQVIST, KARL J., JØRGENSEN, LEIF, and WALLMARK, ARNE. Physical characteristics and chemical composition of alpha-, beta- and gamma-celluloses. I. X-ray diffraction analyses. Svensk Papperstidn. 57, no. 4: 113-18 (Feb. 28, 1954). [In English; German and Swedish summaries]

The authors investigated the chemical composition of the alkali-soluble fractions of holocelluloses and various pulps, using a Guinier powder camera for x-ray diffraction analyses. One of the aims of this study was to ascertain whether or not the method is sufficiently sensitive to detect small amounts of amorphous hemicellulosic material in cellulose II (I). Mercerized cotton linters were used as a standard for (I). (I) was mixed with increasing amounts of amorphous water-soluble hemicellulose from ammonia-swollen spruce holocellulose (containing 16% galactan, 6% glucan, 8% mannan, 7% araban, 58% xylan, and 5% uronic acids). In addition, alkali-soluble fractions of a spruce sulfite dissolving pulp (90% α-cellulose), spruce sulfite greaseproof pulp (86% α-cellulose), pine sulfate pulp (86.5% α-cellulose), pine prehydrolyzed sulfate pulp (93.5% α-cellulose), spruce neutral sulfite pulp, chlorite bleached (63% yield from wood), and spruce holocellulose hydrolyzed with sulfuric acid (56% yield from wood) were investigated. The photometer curves of Guinier diagrams are included. The results indicate that x-ray analysis is too insensitive for the quantitative estimation of amorphous material in admixture with (I). In the present experiments, the minimum detectable concentration of hemicellulose in (I) is about 50%; on the other hand, it is difficult to see any marked peaks in the curve for hemicellulose before at least 20% of (I) is added. The β-cellulose from sulfite dissolving pulp has a (I) pattern; the other β-cellu-

loses investigated contain varying amounts of amorphous material. A portion of the γ-cellulose of sulfite dissolving pulp has possibly a crystalline pattern, whereas the other γ-celluloses investigated are amorphous. The authors conclude that the results obtained by x-ray diffraction analysis of the alkali-soluble fractions from pulps cannot be used as a definite proof of the nature of these heterogeneous materials. The present data are therefore not in agreement with those of Rånby (*cf.* B.I.P.C. 22: 566-7). 1 table, 22 diagrams, and 13 references. E.S.

### CHEMICAL TESTING—JUTE—LIGNIN

MACMILLAN, W. G., SEN GUPTA, A. B., and ROY, A. The determination of lignin in partially delignified jute. J. Textile Inst. 45, no. 2: T108-12 (February, 1954); *cf.* B.I.P.C. 22: 657.

The authors show that the lignin contents of partially delignified jute, determined with 72% sulfuric acid either at 2° or at 22°C., are almost the same as the calculated values obtained by applying the necessary correction factors described in the previous reference. 1 table, 6 diagrams, and 4 references. E.S.

### CHEMICAL TESTING—LIGNOSULFONIC ACID

BRAUNS, F. E., HLAVA, J. B., and SEILER, HEINZ. Determination of sulfur and barium in organic barium sulfonates. Anal. Chem. 26, no. 3: 607-8 (March, 1954); *cf.* B.I.P.C. 24: 451.

The barium in organic barium sulfonates, such as barium lignosulfonates, is separated from the acid component by means of a small cation exchange column, and the sulfur in the eluate is determined according to Salvesen and Hogan (*cf.* B.I.P.C. 19: 153-4). The barium is then eluted with hydrochloric acid from the other end by turning the column 180° and determining the barium as barium sulfate in the usual way. 1 figure and 1 reference. F.E.B.

### CHEMICAL TESTING—PAPER—ALUMINUM

GRAD, PETER P., and CATOTTI, ARTHUR J. Chemical determination of aluminum on metallized paper. Chemist Analyst 43, no. 1: 12-13 (March, 1954).

The procedure is based on the evolution of hydrogen by the reaction of aluminum with sodium hydroxide. An apparatus for carrying out this reaction and measuring the volume of evolved hydrogen is described. 2 tables, 1 diagram, and 2 references. B.L.B.

### CHEMICAL TESTING—PULP—CAUSTIC SOLUBILITY

CENTRAL LABORATORY OF THE CELLULOSE INDUSTRY. *Analysis Committee.* A tentative method for determination of alkali solubility of pulp. Svensk Papperstidn. 57, no. 4: 119-21 (Feb. 28, 1954). [In English; German and Swedish summaries]

A revision of the Swedish Standard CCA 8 (*cf.* B.I.P.C. 15: 46-7) is proposed. The principal changes involve a decrease in the pulp concentration from 5 to 1.5 grams/100 ml. of sodium hydroxide solution and an increase in the period of alkali treatment from 45 minutes to one hour. The method is primarily intended for the determination of the solubility of dissolving pulp in 18% sodium hydroxide, but can also be used for other concentrations; the strength of the alkali solution should be reported in the results, i.e., alkali

solubility (18), alkali solubility (10), etc. When used for paper-grade pulps, the alkali treatment should be extended to 18 hours, because the alkali-soluble fraction dissolves much slower in this type of pulp (*cf.* Rutishauser, B.I.P.C. 24:541). 2 figures and 5 references. E.S.

## CHEMICAL TESTING—TANNING MATERIALS

AMERICAN LEATHER CHEMISTS ASSOCIATION. Methods for the analysis of vegetable tanning materials. J. Am. Leather Chemists Assoc. 49, no. 3: 174-207 (March, 1954).

The A.L.C.A. provisional methods, February, 1954, are given; they cover methods for sampling and extraction of raw and spent materials, determination of nontannins and tannin, and analysis for sugar. A test for detecting lignosulfonates (sulfite cellulose) in extracts of tanning materials is included. 2 tables and 4 figures. B.L.B.

## CHLORINE

ANON. Chlorine capacity sufficient. Chem. Eng. News 32, no. 12: 1168 (March 22, 1954).

The total production of chlorine in 1953 should amount to near 3 million tons; the pulp and paper industry consumed 14% of the chlorine production in 1952 and 14.2% in 1953. There are about 70 chlorine plants in this country at present, 25% of them captive installations in the pulp and paper industry. 3 tables. R.A.S.

CHEMICAL ENGINEERING. Chlorine-caustic outlook bright. Chem. Eng. 61, no. 3: 193 (March, 1954); *cf.* B.I.P.C. 23: 547.

Chlorine-caustic capacity is now 20% more than demand; however, future prospects for chlorine (titanium metal production) are bright. In some producing areas an improved balance in the demands for caustic soda and chlorine exists; Gulf Coast producers, however, face a real problem in disposing of excess soda. Several new installations with mercury cells started operations in 1953. 1 diagram. E.S.

R. F. New technical chlorination methods. Wochbl. Papierfabrik. 81, no. 24: 944 (Dec. 31, 1953). [In German]

The use of dilute chlorine dioxide gas for scrubbing and deodorizing evil-smelling waste gases and of aqueous solutions of dichloro-dimethyl-hydantoin, a white powder which contains 66% active chlorine, for the disinfection of papermaker's felts, ion-exchange filters, etc. is discussed briefly. E.S.

## CHLORINE DIOXIDE

BEAUDRY, L. A. New developments with chlorine dioxide generation. Paper Mill News 77, no. 12: 83-4, 115 (March 20, 1954); *cf.* B.I.P.C. 24: 97.

The Solvay process for producing chlorine dioxide from sodium chlorate, sulfuric acid, and methyl alcohol circulated between and within three reactors and the instrumentation and operating controls of the equipment are outlined. 3 figures. E.S.

HURTUBISE, F. G. Chlorine dioxide pulping of jack pine and black spruce chips. Pulp Paper Mag. Can. 55, no. 3: 173-4 (Convention issue, 1954).

Jack pine and black spruce chips were treated with chlorine dioxide solution at 60°C. After 70 hours the jack pine chips were not completely penetrated. When thinner black spruce chips were used, a reasonably white pulp was obtained after 50 hours. A relatively high yield (65%) of pulp was obtained. This pulp was low in lignin and resin and high in pentosans indicating thorough delignification with very little destruction of the carbohydrate components. The amount of chlorine dioxide required was 50% of the weight of the wood. 3 references. E.S.

## CHROMATOGRAPHY

BRANDENBERGER, HANS. The use of cellulose for an adsorbent for blood plasma proteins from aqueous solution. Helv. Chim. Acta 37, no. 1: 97-103 (Feb. 1, 1954). [In German; English summary]

Cellulose powder columns may be used as adsorbents for the proteins of blood plasma. Fibrinogen is retained, but none of the main components of the native serum. Albumin and an $\alpha_1$-acid glycoprotein are not adsorbed. $\gamma$-globulins of fresh serum are not adsorbed, but are partly adsorbed as obtained by alcohol-salt fractionation. This is attributed to denaturation changes during isolation, storage, and contact with the column. These may be more pronounced in paper chromatography than with the column on account of the greater liquid-gas interface. 1 table and 25 footnotes. K.W.,Jr.

MICHEEL, FRITZ, and SCHWEPPE, HELMUT. Paper-chromatographic separation of the higher fatty acids by means of cellulose acetate paper. Angew. Chem. 66, no. 5: 136-7 (March 7, 1954). [In German]

Saturated straight-chain fatty acids containing from 5 to 18 carbon atoms could be separated chromatographically as the corresponding hydroxamic acids (prepared from the corresponding methyl esters, hydroxylamine, and potassium hydroxide). Spot identifications were made using the intense colorations given by ferric complexes with the hydroxamic acid. 2 figures and 8 references. L.E.W.

## COLOR-BLINDNESS

lar color matching. J. Opt. Soc. Amer. 44, no. 3: 207-12 (March. 1954).

A method is described for determining the fundamental response functions of the Young-Helmholtz three-receptor hypothesis by means of binocular color-matching data. The method is an extension of the methods described previously by Wright and by Walters. Data supplied by Burnham, Evans, and Newhall (*cf.* B.I.P.C. 23: 166-7) are used to determine a set of the functions. These results are compared with those obtained previously in adaptation experiments and with those implied by results of color-blindness investigations. 3 figures and 8 footnotes. E.S.

## COLORIMETRY

ELECTRONIC MACHINE COMPANY, *Thornton Heath, Surrey, England.* Electronic Machine Company's Colorometer. World's Paper Trade Rev. 140, no. 24: 1783 (Dec. 10, 1953).

A brief description of the instrument, which is principally used for testing a colored paper against a standard, is given. 1 illustration. E.S.

## CONTAINER INDUSTRY

BERNATÉNÉ, HENRI. Three years of organization in the box-making industry. Rev. papiers et cartons 16, no. 4: 7-13; no. 5: 7-8; no. 6: 6-9; no. 8: 21-4; no. 9: 15-21; no. 11: 11, 13-15, 17, 19; no. 13: 15-18; no. 18: 12-17; no. 19: 6, 8, 11, 13 (Feb. 15, March 1, 15, April 15, May 1, June 1, July 1, Sept. 15, Oct. 1, 1953). [In French]

Based on a number of surveys carried out in different French boxmaking plants (including the entire range from luxury boxes to functional corrugated shipping containers), a theoretical and practical study is presented in which administrative, financial, commercial, technical, and miscellaneous problems peculiar to the container industry are analyzed. The streamlined reorganization of obsolete procedures is suggested for placing this section of the French industry into a better position to meet foreign competition. 11 tables and 20 figures. E.S.

GATES, JAMES E. Structure and growth of the fibre box industry. Fibre Containers 39, no. 2: 48, 50, 52, 57-8, 60-2, 64, 66, 68-70, 72 (February, 1954).

The development of the fiber-box industry is traced from 1923 to 1952; the volume of shipments during these years rose from 9,698,900,000 sq. ft. to a high of 78,392,900,000 sq. ft. in 1950 and then receded to 74,445,900,000 sq. ft. Statistics on the relative growth of two types of plants, converter and sheet, are presented, as well as on employment, equipment, investment, location of box plants, capacity and variety of production, and inventory. Mechanization in the industry, raw materials in use, wartime problems encountered, integration in the industry, trade associations, multiple ownership, the changing structure of the industry, and the future of sheet plants are discussed. 14 tables and 1 diagram. R.A.S.

## CONTINUOUS COOKING PROCESS

LUNDBERG, L. A. Progress in Kamyr's continuous cooking. Paper Trade J. 138, no. 13: 20-3 (March 26, 1954).

A continuous cooking process developed by Kamyr capable of yielding high-quality kraft and semichemical pulps is outlined. The chips are first passed to a low-pressure horizontal steaming vessel where they are moved along by a screw conveyor. The heated chips are discharged through a special rotary valve and introduced directly into a long vertical digester where they are cooked with fresh cooking liquor at a pressure of 140-150 p.s.i. at about 100°C. The chips move downward by gravity to the bottom of the cone where a scraper-dilution system ensures uniform feed to the continuous blow valve. The cooked stock is blown into an hourglass-shaped blowtank, the neck of which effectively isolates the two sections and allows different temperature conditions to exist in them. A 5-7-p.s.i. steam pressure and corresponding temperature can be maintained in the upper section for maximum heat recovery, while the stock is diluted and cooled for washing in the lower. From the lower section the stock may be sent either to the washer or to the preliminary refining department, depending upon the type of pulp required. The advantages of the process (reduced digester corrosion, low chemical and power consumption, absolute control of cooking temperature

and time, and pulps of superior quality) are discussed. 1 flowsheet and 5 figures. E.S.

### COOKING PROCESS

MCKEE, RALPH H. Comparison of wood pulping processes. Pulp Paper Mag. Can. 55, no. 2: 64-6 (February, 1954); *cf.* B.I.P.C. 17: 283.

An outline of the principle and procedures of the hydrotropic pulping process with sodium xylenesulfonate is given; its advantages over the standard sulfate process are emphasized. E.S.

SOLECHNIK, N. YA., NOVOSEL'SKAYA, A. I., and IVANOVA, A. P. The preparation of brown wood pulp from chips. Bumazh. Prom. 28, no. 11: 25-8 (November, 1953). [In Russian]

For abstract *cf.* C.A. 48, no. 6: 3685-6 (March 25, 1954). 2 tables and 2 figures. E.S.

SUREWICZ, WLODZIMIERZ. Intensification and rational development of technological processes in U.S.S.R. pulp mills. Przeglad Papierniczy 9, no. 11: 321-5 (November, 1953). [In Polish]

For abstract *cf.* C.A. 48, no. 5: 3027 (March 10, 1954). 2 tables and 5 figures. E.S.

### CORROSION

LEFEBVRE, F. J. Cathodic protection for the prevention of corrosion in equipment for the treatment of white water. Tappi 37, no. 3: 152-4A (March, 1954).

The principles of cathodic protection, and its application to white water systems, correct installation, and maintenance are described. Any change in white water treatment, painting of the structure, etc. should be reported to the manufacturer, because it may call for a change in current density. 2 figures. E.S.

LYDICK, GEORGE R. The application of noncorrosive materials. Tappi 37, no. 3: 162-4A (March, 1954).

The author discusses specific applications of noncorrosive constructional materials in the acid and alkaline pulping processes, with particular reference to brick, tile, and cement linings, stainless steels, asbestos pipe and sheets, rubber linings, and plastic coatings. E.S.

### COST—ACCOUNTING

BERTEL, C. ALVIN, JR. How one paper company trims cost. Paper & Twine J. 27, no. 12: 9, 22-3 (February, 1954).

The author presents a method of cost control based on maintaining ratios of each overhead item as compared with the gross average sales, computing the break-even point, and carrying the figures upward to the exact spot at which variable or combination fixed and variable costs should increase. 1 illustration. R.A.S.

### COTTON

COMPTON, JACK. New textile fibers with the structural elements

of natural cellulosic fibers. Am. Dyestuff Reptr. 43, no. 4: P103-11 (Feb. 15, 1954).

The author describes the structures of natural cellulosic fibers to make clear why chemical treatment without alteration of that structure is advantageous. Cotton, which is by far the most important commercial fiber in use and which continues to hold the leading place in textiles, is so useful not only because large amounts are economically available but also because cotton as a fiber is most versatile in its adaptability to many purposes. By chemical modification of the cellulose constituting cotton it is possible to maintain the natural structure of the fiber—which has great engineering advantages—to obtain new desirable properties. Mercerization has long been employed for this purpose, and now cyanoethylation offers even greater possibility of improvement with retention of fiber structure. Cyanoethylation has been shown to increase the resistance of cotton to mildew and bacterial attack, to give greater heat resistance, greater abrasive resistance, and increased affinity for dyestuffs. Acetylation without solution of the cellulose may also be employed especially to obtain greater heat and biological resistance. 5 tables, 15 figures, and 46 references. E.S.

## DEAERATION

GAVELIN, GUNNAR. Some effects of gases on properties of fibre suspensions. Pulp Paper Mag. Can. 55, no. 3: 191-200 (Convention issue, 1954).

Most of the gas normally entrained in headbox stock bubbles off spontaneously. Some of it, however, remains on the fibers and has a noticeable effect upon formation on the wire and upon paper quality. There is evidence to show that some of this closely associated gas is the result of evolution from supersaturated solutions, and that this generated gas is much more detrimental than entrained air because of its association with the fibers. The effects of this gas have been studied with the help of two different types of drainage testers. The results give some indication of the mechanism by which the residual or generated gas is formed and suggest ways of avoiding gas formation in paper stock. It appears that the gas is set free from a supersaturated solution when this is brought in contact with fibers because bubbles are more easily developed on nonwettable parts of fibers than in a clear liquid. Gas evolution can be avoided by deaeration of headbox stock. It will also help to deaerate the stock or the fresh water added through the sprays. The reactions are influenced by pH. 6 tables, 20 figures, and 7 references. E.S.

## DIGESTERS

CANAVAN, H. M., and PARKER, W. B. Safety evaluation and protection of digesters. Tappi 37, no. 3: 115-20 (March, 1954); Can. Pulp Paper Ind. 7, no. 4: 30-4, 130 (April, 1954).

The procedure to be followed in making a complete inspection of a digester is discussed. The visual examination of the digester and its appurtenances, methods of determining the thickness of the shell and heads, and the proper recording of the information developed on TAPPI Data Sheets are described. The interpretation of the results to obtain the location of critical areas, the safety status of the digester, whether repairs are required or not, and an estimate of the remaining service life are included. Overpressure safety systems for digester protection are also covered. 1 figure. E.S.

KRAUS, F. M. A study of the problem of the design of ceramic lined digesters. Pulp Paper Mag. Can. 55, no. 3: 204-12 (Convention issue, 1954).

An investigation of the causes of recent failures of lined cylindrical welded sulfite digesters is described. The cracks which developed in the linings of the digesters as a rule ran up and down the cylindrical section, with minor branching into the top dome or bottom cone section. Horizontal or nearly horizontal cracks were short and considered secondary accompanying features. Hence, attention was mostly concentrated on the stress condition existing or developing in a composite circular ring section. The following conditions were analyzed: circular ring under internal pressure, out-of-roundness, linear temperature expansion, bending resulting from temperature gradient, and swelling of lining. The results, which are given and discussed in considerable detail, seem to indicate that linings with a lower modulus of elasticity would be advantageous, that thinner linings would lower the lining stress level, and that this could be achieved by using a single brick course with substantial backing with mortars of controlled growth characteristics, as in riveted digesters. The amount of swelling introduced with the mortar should be governed by tensile stresses arising in the lining from all loads and by the strain compatibility between steel shell and lining. Considerable further study of the problem of ceramic-lined digesters is necessary; a research program should be undertaken to eliminate as many of the unknown factors as possible. Suggestions for the approach to such a program are included. 2 tables and 4 diagrams. E.S.

## DRYING—PAPER

KUSNERUS, JAMES L., and MOEHLMAN, RICHARD E. Drying converted paper products with radiant gas burners. Paper Ind. 35, no. 12: 1314-17 (March, 1954).

Drying by radiant gas burners depends on the temperature and humidity of the air (I) and the gas (II) in contact with the paper (III), the conditions of its exposure to (I) and (II), the velocity and turbulence of (I) and (II), and on the radiant heat. The character of (III) is also important, especially with regard to surface roughness and porosity, the materials used in its manufacture, its surface coating, the amount of water in (III), and the maximum energy-absorption capacity of (III) without spoilage. A mathematical dimensional equation (IV) was found to be valid by experiment. The relationship between drying rate and drier number was linear up to a certain critical point, which in practice was not reached without spoiling (III). For plain kraft paper drying rates (V) were roughly proportional to the basis weight. For converted paper products the slope of the (V)-line characterized the product. In (IV), heat is the most important factor; other less pronounced variables (in decreasing order of importance) were: flow from the exhaust stack; distance between burners and (III); the speed of (III); and the water content of (III). The test machine used in gaging the drying effects is described and illustrated, and the effects of varying the positions of the exhaust dampers are discussed. 1 table and 10 figures. L.E.W.

PAPER-MAKER (LONDON). Knowledge and its enlargement. Drying—theory and practice in brief. Paper-Maker (London) 127, no. 2: 102-5 (February, 1954); *cf.* B.I.P.C. 24: 455.

A condensed account of the theory of drying and a discussion of the factors affecting drying on a paper machine with felted driers or an unfelted Yankee cylinder are presented. 2 diagrams. E.S.

## DUST EXPLOSIONS

BROWN, HYLTON R. Dust-hazard control in woodworking plants.

J. Forest Products Research Soc. 4, no. 1: 65-7 (February, 1954).

The relative danger of the dust hazard in woodworking plants is explained, and methods for keeping plants free of this hazard are given. Methods for minimizing the effects of possible explosions are also described. E.S.

## DYES AND DYEING

FORDEMWALT, FRED. Dyeing of cellulose. Chem. Eng. News 32, no. 10: 924-6 (March 8, 1954).

The United States consumed more than 5.5 billion pounds of cellulosic fibers in 1952—88.5% of the total fiber consumption. The ability of cellulose to hold this lead against new synthetics is attributed to continued research in the dyeing of cellulose. The complexity of cellulose, different kinds of dyes, permanency of dyes, commercial applicability, processes and their requirements, and physical and chemical factors are discussed. 2 figures. R.A.S.

MCGINN, E. P. Efficient use of dyes in paper. Tappi 37, no. 3: 146-51A (March, 1954).

A general discussion of paper dyeing is presented, including methods of coloring (beater and surface coloring), classes of color, order of addition, choice of colors, color dimensions, color matching, instrumentation, pH control, and chemical assistants. E.S.

## ENZYMES

MCLAREN, A. DOUGLAS. The adsorption and reactions of enzymes and proteins on kaolinite. I. J. Phys. Chem. 58, no. 2: 129-37 (February, 1954).

Enzymes and other proteins are readily adsorbed by silicate minerals under proper conditions of pH and solvent composition. Adsorption leads to a reduction or loss of enzyme activity. The adsorption of proteins on kaolinite seems to involve partly an ion exchange with adsorbed metal cations and partly simple adsorption on the external surfaces of particles. Adsorption isotherms are presented. The amount of a protein (lysozyme) adsorbed at a given total protein concentration and pH depends upon the concentration of buffer, the chemical composition of the buffer (acetate, phosphate, ethylammonium) and the concentration of neutral salts, e.g., sodium chloride (0-0.1 *M*) present. The maximum amount of lysozyme adsorbed corresponds roughly to the surface area of an unfractionated kaolinite; the number of cationic groups involved in the lysozyme is nearly equal to the exchange capacity of the kaolinite. Less than a stoichiometric amount of cation is released to the solvent medium during the adsorption of lysozyme on sodium-saturated kaolinite, which is consistent with the amphoteric nature of proteins. The adsorption of a protein (ovalbumin, pepsin, trypsin inhibitor, chymotrypsin, lactoglobulin, lysozyme, etc.) to kaolinite above the isoelectric point of the protein is relatively low or nil compared with the amounts adsorbed below the isoelectric point. 3 tables, 8 diagrams, and 45 footnotes. E.S.

## FIBERS

LATHROP, E. C., and NELSON, G. H. The chemical composition of some leaf and bast fibers. Tappi 37, no. 3: 99-103 (March, 1954).

Proximate chemical analyses are presented for 15 of the more common

bast and leaf fibers—various samples of abaca, henequen, sisal, caroa, kenaf, ramie, hemp tow, and seed-flax tow. These fibers are uniformly low in lignin and high in cellulose contents. The leaf fibers are higher in pentosan content than the bast fibers, but lower than cereal straws and bagasse. Since bast and leaf fibers could contribute high-tearing strength to specialty papers made from them, some small-scale preliminary pulping experiments are reported. Chemical requirements for pulping seem to be lower and pulp yields higher than indicated in the older literature. 2 tables and 8 references. E.S.

PARSONS, H. L. Bast fibres—chemistry. Rev. Textile Progr. 4: 60-72 (1952); *cf.* B.I.P.C. 23: 553.

The literature published during 1952 on the chemical aspects of bast fibers is summarized, including sections on microbiology, chemical constitution (lignin and hemicellulose and cellulose), and processing. 113 references. R.A.S.

## FINGERPRINTS

ODÉN, SVANTE, and HOFSTEN, BENGT VON. Detection of fingerprints by the ninhydrin reaction. Nature 173, no. 4401: 449-50 (March 6, 1954).

A method for making fingerprints on paper visible (even if the paper has not been touched for a number of years) involving the well-known ninhydrin test for amino acids is described. The fingerprints are developed by spraying the paper with a 0.2% solution of ninhydrin in acetone, followed by heating the paper in an oven at 80°C. for a few minutes. The pink color becomes more intense with time, and details seem to have a maximum distinctness a day or two after the ninhydrin treatment. After a paper has been treated with the reagent, it must not be touched by hand or new fingerprints will develop even if the paper is dry. 1 figure and 2 references. E.S.

## FINISHING ROOM

G. N. The sorting of sheeted paper. Allgem. Papier-Rundschau no. 2: 52-3 (Jan. 20, 1954). [In German]

The sorting of paper from high-speed cross cutters in the finishing room can be considerably speeded up when defects occurring during manufacture are marked on the rolls, such as overweight paper, splices, spots, offshade paper (I), rolls with higher than standard moisture content (II), etc. (I) and (II) should be kept entirely separate and not be mixed with the paper of the regular run. Mechanized handling in the finishing room, trucks with rubber wheels, sorting tables which can be automatically lowered and raised as needed, and correct illumination from above, preferably without direct sunlight will increase the quality and quantity of the output from the finishing room to quite an extent. E.S.

## FLOCCULATION

MARDON, J., and MEER, W. VAN DE. Flocculation, formation and head box design from the aspects of turbulent motion. Paper-Maker (London) 127, no. 1: 17-20; no. 2: 106-8, 110, 112, 114, 116, 118, 121-2 (January, February, 1954).

In the first part of the article, the authors critically review the more recent literature on the subject of flocculation and formation; the suggestion is put forward that there exists a possibility of investigation of this problem from the aspect of turbulent motion. Possible lines of attack are listed. In

the second part, an explanation of the principles of turbulent motion is given. Different headbox designs, including the most advanced types built today, are considered from the viewpoint of the hydrodynamics of turbulent motion. 16 diagrams and 37 references. E.S.

ROBERTSON, A. A., and MASON, S. G. Flocculation in flowing pulp suspensions. Pulp Paper Mag. Can. 55, no. 3: 263-9 (Convention issue, 1954); *cf.* B.I.P.C. 21: 316.

The aggregation of suspended pulp fibers flowing through a glass tube has been investigated by measuring fluctuations in light transmission at fiber concentrations up to 0.7% and velocities up to 700 f.p.m. Two sharply defined transitions in flocculation behavior were found when the stock velocity was varied. The two transition velocities were reproducible, and both increased with fiber concentration. These transitions have been correlated with transitions in friction loss-velocity curves and have been interpreted as manifestations of changes between the domains of plug and mixed and distributed flow. Above the first transition velocity, there was a progressive decrease in flocculation with increase in velocity and decrease in concentration. The addition of locust bean gum caused a measurable decrease in flocculation and altered the transition velocities. The significance of some of these observations is discussed. 2 tables, 12 figures, and 15 references. E.S.

## FLOTATION

WITTMANN, GÜNTHER. Flotation problems in the paper industry and flotation agents. Svensk Papperstidn. 57, no. 3: 92-5 (Feb. 15, 1954). [In German]

Following a theoretical introduction on the principles of flotation, the author describes the superiority of a new agent (Ragaton FR, made by Saltängens Tekniska Fabriks AB, Norrköping, Sweden) over rosin size and ordinary and Sveen glue for fiber flotation and retention. 2 tables and 1 diagram. E.S.

## FOAM

ROSS, SYDNEY, BARTH, BRUCE, and TERENZI, J. F. The inhibition of foaming. VI. The transmission of light by unstable foams. J. Phys. Chem. 58, no. 3: 247-50 (March, 1954); *cf.* B.I.P.C. 24: 192.

The ratio of the incident to the emergent light (loss factor) passed through a foam is directly proportional to the specific surface between the phases, according to Clark and Blackman (*cf.* B.I.P.C. 18:750-1). This relation is used to obtain a measurement of the stability of the surface films for foams containing different compositions of two antifoaming agents. The results parallel those obtained by measuring the foam stability, $L_t$, from observations of the decrease in total volume of the foam. The increase of permeability of the liquid films to the passage of air is shown to be a concomitant effect with the decrease of cohesion and elasticity of the films effected by the antifoaming agent. This work provides a simple method, using the Lumetron colorimeter, for the rapid evaluation of the effectiveness of different antifoams, their optimum concentrations, and the investigation of synergistic antifoaming mixtures. 3 diagrams and 6 footnotes. E.S.

### FOLDING BOXES

NEWELL, JOHN C., JR. Folding paper boxes. Graphic Arts Monthly 26, no. 3: 58, 60, 62, 64 (March, 1954).

Following a brief definition of a folding carton, the author discusses the skill necessary in cutting and creasing and the development of printing on folding boxes. 4 illustrations. R.A.S.

### FOREST FIRES

HOWIE, E. L. The feeding of men on the fire line. Pulp Paper Mag. Can. 55, no. 2: 84, 86, 89 (February, 1954).

A list of food items contained in an emergency fire fighters ration box providing sufficient food for six men for one meal is presented. A parallel is drawn between providing food for fire fighters and camp feeding. A meal of sandwiches and cookies is considered most feasible at the present time; study on the development of hot lunches is recommended. 1 table. R.A.S.

### FORESTS AND FORESTRY

LACHANCE, PAUL E. Quebec's pulpwood resources; a study of the pulp and paper industry of the province of Quebec in relation to its present and future wood supplies. Pulp Paper Mag. Can. 55, no. 3: 276-8, 281-2, 285-6, 289-90, 292, 295, 298, 300, 302, 304, 306, 310, 313, 315-16, 319-20, 323, 325, 327, 329, 331-2 (Convention issue, 1954).

A detailed statistical analysis of the pulpwood resources in the province of Quebec is presented; three main parts cover the Quebec pulp and paper industry, a survey of the Quebec wood supply and an estimate of a sustainable annual cut of softwood, and measures toward assuring a continuous softwood supply to the Quebec pulp and paper industry. The discussion is presented under the following chapter headings: pulpwood consumption of the pulp and paper industry by groups of mills; analysis of the 1950-51 pulpwood cut and distribution to mills, by groups; distribution of the forest land of Quebec by availability for major uses, ownership, and groups of watersheds; wood inventory by groups of watersheds; gross sustainable cut of softwood, under present conditions; net sustainable cut of softwood under present conditions; present average annual cutting drain (1947-1950); possibilities of increasing the yield through better utilization; possibilities of increasing the sustainable softwood cut through increased growth by better management; contribution of Quebec's last virgin forest stands; and a provincial plan for sustained field management of crown lands. 20 tables, 3 diagrams, 5 maps, 24 footnotes, and 30 references. R.A.S.

SENTELL, N. W. Industry nursery. Southern Pulp Paper Mfr. 17, no. 3: 32, 34 (March, 1954).

The advantages of a company operating its own nursery for seedlings are discussed, particularly the control over the supply and variety of stock. R.A.S.

### GLUE AND GELATINE

NATIONAL ASSN. OF GLUE MANUFACTURERS, INC. Animal glue in industry . . . Parts I and II. Paper, Film and Foil Converter 28,

no. 2: 26-8; no. 3: 28-9 (February, March, 1954); Am. Boxmaker 43, no. 2: 16-17; no. 3: 17 (February, March, 1954).

Following a brief summary of the history of animal glues, the essentials of processing are discussed. Lists of chemical and physical properties and principal general considerations in handling are presented. Modifications are employed to produce flexible and nonwarp glues; the latter's greatest application is in the paper-box industry for covering setup boxes. Treatment with tanning and insolubilizing agents produces water-resistance; the producer of gummed tapes can readily formulate a gumming adhesive to fit practically any customer requirement. R.A.S.

### HISTORY

VAULTIER, ROGER. The history of the calling card. Papetier 7, no. 12: 37-41 (December, 1953). [In French]

Opinions vary a good deal with regard to the origin of the calling card; many believe that it was introduced from China as were so many other inventions. In the 16th century artistic calling cards were known in Italy. In France playing cards with the name written by hand on the back were used for a long time for this purpose. The later development is illustrated by representative examples from different periods. 9 illustrations. E.S.

### INORGANIC PAPER

TEMPLE, R. B. Paper from inorganic fibres; progress of American research. World's Paper Trade Rev. 140, no. 24: 1803-4 (Dec. 10, 1953). [Abridgment]

A brief account of the preparation and properties of papers manufactured from glass, hydrated and anhydrous quartz, and aluminum silicate (Fiberfrax) is given. E.S.

### INSECTS AND VERMIN

INCHO, HARRY H., INCHO, EILEEN J., and MATTHEWS, NORRIS W. Insect-proofing paper; laboratory evaluation of pyrethrins-piperonyl butoxide formulations. J. Agr. Food Chem. 1, no. 20: 1200-3 (Dec. 23, 1953).

Three formulations of pyrethrins with piperonyl butoxide were applied to natural kraft paper to determine comparative insectproofing properties. The formulations—a wettable powder slurry, a petroleum oil solution, and an emulsion—were applied at three dosage levels. Samples of the paper were analyzed for piperonyl butoxide and were evaluated biologically immediately after, six months after, and one year after treatment. There was no loss of piperonyl butoxide during the one-year period. Biologically the treated paper, regardless of length of time after treatment, afforded protection against boring insects for two months to more than a year, depending on the dosage and the type of formulation used. Untreated kraft paper, in comparative tests, was penetrated by insects in an average of five days. 3 tables, 2 illustrations, and 14 references. E.S.

### INSTRUMENTATION

KENNEDY, L. E. Graphic panel aids paper mill operation. Southern Pulp Paper Mfr. 17, no. 3: 44, 46, 48, 50 (March, 1954); Instrumentation 7, no. 2: 4-8 (January-March, 1954).

Control panels of the semigraphic type, in which dial indicators, liquid-level scales, and signal lights are located directly on the process flow diagram with the recording and controlling instruments immediately below, have been installed on each line of three single-stage Impco continuous vacuum washers at the Charleston, S.C. mill of West Virginia Pulp and Paper Co. The panels, the first ever to be installed in a paper mill on washer lines, reduce operator training time, ease preventive maintenance, and save time for supervisory personnel. 2 flowsheets and 5 illustrations. R.A.S.

KOSBAHN, THOMAS. Automatic control and measurements in the pulp and paper industry. Das Papier 8, no. 3/4: 37-43 (February, 1954). [In German; English and French summaries]

The author discusses the possibilities of automatic process control in sulfite and sulfate mills, bleach plants, and paper mills and the resulting advantages (increase in yield and safety, improvement in quality, and reduction in manpower). Examples of applications are included. 1 table and 8 figures. E.S.

## INSURANCE

FREEMAN, NORMAN, and YOWELL, L. Q. Are you prepared in case disaster strikes? Am. Paper Merchant 51, no. 3: 28-30, 81 (March, 1954).

Precautions which should be taken to meet unexpected destruction by fire, tornado, and the like are the provision of a strong fireproof safe for all records necessary for the transaction of business, and building and inventory insurance. 6 illustrations. R.A.S.

## INTEGRATED FOREST UTILIZATION

LOCKE, EDWARD G. Chemical utilization and forest management. J. Forest Products Research Soc. 4, no. 1: 10-13 (February, 1954).

The author discusses the relationship between chemical utilization and forest management. New products in the trend toward complete mechanical and chemical utilization are described, including paper-covered veneer, resin-bonded paper honeycomb cores, pulp from logging and sawmill wastes, and products of hydrolysis and extraction. 15 references. R.A.S.

## LABORATORIES

ANON. Howard Paper Mills' new laboratory. Southern Pulp Paper Mfr. 17, no. 3: 26 (March, 1954); Paper Ind. 35, no. 12: 1300 (March, 1954); Tappi 37, no. 3: 116A (March, 1954).

The new laboratory of the Aetna Paper Division mill of Howard Paper Mills Inc. at Dayton, Ohio is described briefly. The laboratories are located on two floors with individual air-conditioning systems. In addition to general paper research and new-product development, the laboratories supervise all quality control over pulp and rag supplies, paper in production, and finished paper. 3 illustrations in the first and third references and 2 in the second. E.S.

## LIGNIN

ADLER, ERICH, and YLLNER, SVEN. Synthesis and reactions of alpha-(3-methoxy-4-hydroxyphenyl)-glycerol ("guaiacylglycerol").

III. Sulphonation and "ethanolysis." Svensk Papperstidn. 57, no. 3: 78-82 (Feb. 15, 1954). [In English; German and Swedish summaries] *cf.* B.I.P.C. 23: 809.

In accordance with other *p*-hydroxybenzyl alcohols, guaiacylglycerol (I) is rapidly sulfonated by sulfite solutions over a pH range of 1.5-9. On heating (I) with ethanolic hydrochloric acid (ethanolysis), α-ethoxy-propioguaiacone, vanilloyl methyl ketone, and guaiacylacetone are formed. These and some other lignin model reactions of (I), veratrylglycerol, and the β-guaiacyl ether of veratrylglycerol are summarized; the possible occurrence of guaiacylglycerol-β-aryl ether linkages in lignin is discussed. 1 figure and 24 references. E.S.

KRATZL, K., and WITTMANN, E. Reactions of diazomethane with α,β-unsaturated aldehydes. (A contribution to the study of the color reactions of wood.) Monatsh. Chem. 85, no. 1: 7-22 (Feb. 15, 1954). [In German]

When sprucewood and isolated native lignin are treated with diazomethane, they no longer give the color reactions with phenols and hydrochloric acid. This reaction was studied with model substances such as α,β-unsaturated aldehydes (cinnamyl aldehyde and 3,4-dimethoxycinnamyl aldehyde). These aldehydes react with diazomethane with the formation of small amounts (3.12 and 2.7%, respectively) of pyrazole derivatives. The authors conclude that the small amount of nitrogen which is sometimes found in diazomethane-methylated wood and lignin preparations (a native spruce lignin methylated with diazomethane contains 0.87% nitrogen and gives no color reaction) is also the result of pyrazoline formation. 39 references. F.E.B.

LEOPOLD, BENGT. Recent lignin research in Sweden. Pulp Paper Mag. Can. 55, no. 3: 184-6 (Convention issue, 1954).

The author reviews recent Swedish research by Lindgren, Adler, and himself on the manner in which the lignin elements are linked together and on the nature and location of the sulfonatable groups in the lignin molecule. The results show that softwood lignin consists of guaiacyl propane elements connected to each other through ether and carbon-carbon linkages, probably randomly distributed in approximately equal proportions. All or most of the reactive groups are located at the α-carbon atoms of the side chains and consist of hydroxyl or ether groups. Some of the groups consist of highly reactive hydroxyl or ether groups, some of them activated by phenolic hydroxyls; the remaining groups consist of ether linkages which are hydrolyzed or sulfonated only under acid conditions. The second type of linkages join the lignin to the rest of the cell wall, e.g., to other lignin or carbohydrate molecules. 8 figures and 2 references. E.S.

SEIFERT, KARL. New reactions of native lignin. Faserforsch. u. Textiltech. 4, no. 8: 342-6 (August, 1953). [In German]

The color reactions of various simple model substances of lignin have been studied by their interaction with phloroglucinol, *p*-phenylenediamide, and acetylacetone (I). The reaction of lignin with (I) was investigated in detail by extracting pre-extracted pine sawdust with (I) in the presence of hydrochloric acid, whereupon the lignin dissolved quantitatively, leaving an almost white cellulosic residue in about 40% yield. From the extract an acetylacetone pine lignin (II) with 66.05-67.67% carbon, 5.8-6.11% hydrogen, and 9.15-10.15% methoxyl and a molecular weight of 860 was obtained. (II) contains 1-2 carbonyl groups as shown by oxime formation. Similar extrac-

tions of fir, beech, and oak give 40, 39.6, and 35.5% of cellulose and 28.5, 22.0, and 18.9% of acetylacetone lignins, respectively. 3 tables, 1 figure, and 25 references. F.E.B.

### LOADING AND UNLOADING—CARS

FOOD ENGINEERING. Damage to packaged food—and how to avoid it when shipping by rail. Food Eng. 26, no. 3: 75-7, 132 (March, 1954).

Shift in load caused by improper handling of car in transit, poor arrangement of load, and shift in load as a result of loose loading are the most outstanding in a list of causes for damage to packaged food in transit; ways of correcting these and other losses are given. 16 figures. R.A.S.

### LUBRICATION AND LUBRICANTS

MCKEOWN, J. S. Filters and purifiers for oil circulating systems. Paper Trade J. 138, no. 12: 22-5; no. 13: 26-9 (March 19, 26, 1954).

The author stresses the very definite relationship existing between effective lubrication and oil cleanliness. Following a brief discussion of contamination from extraneous matter and that resulting from oil oxidation, available oil filter and purification equipment is described under: settlers (gravity settlers, baffle gravity settlers, and gravity troughs), centrifuges, and filters (mechanical, magnetic, absorbent, and adsorbent types), including suitable applications and limitations of each. In conclusion, the four commonly used methods of filter and purifier installations in pressure circulating systems (the by-pass method, the independent system, and the shunt and full-flow connection) are outlined. 1 table and 13 figures. E.S.

MEDZWIECKI, T. M. A report on a lubrication survey in a large paper mill. Pulp Paper Mag. Can. 55, no. 3: 166-70 (Convention issue, 1954).

Rising lubrication costs in a pulp and paper mill prompted an investigation to determine whether or not these costs were justified. At first only a representative part of the mill was surveyed, and an interim report was made on the findings. It was then decided that the survey should continue and cover the entire mill; the outcome of this survey is described. The losses of oil on one of the paper machines equipped with an automatic lubricating system were found to represent the big item in the mill's high lubrication costs. Most of the losses on the machine are a consequence of the machine's condition and are not caused by the automatic system. As a result of this survey a planned lubrication system will be installed; the benefits to be derived from it are outlined. 2 tables. E.S.

### MACHINERY

SZWARCSZTAJN, EDWARD. Some new problems in U.S.S.R. paper mills. Przeglad Papierniczy 9, no. 11: 325-30 (November, 1953). [In Polish]

For abstract *cf.* C.A. 48, no. 5: 3027 (March 10, 1954). 1 table and 9 figures. E.S.

### MACHINERY—BOARD MACHINES

ANON. The new board machine at G. A. Serlachius Oy at Tako. Paper and Timber (Finland) 36, no. 2: 45 (February, 1954). [In Swedish]

A brief description of the new five-uniflow vat board machine built by Voith in Germany is given. The machine which started production on Dec. 15, 1953 has a daily output of 60-70 metric tons of container or folding boxboard. 2 figures. E.S.

### MACHINERY—CABLES

MORTENSON, A. O. Electric wire and cable recommendations for the pulp and paper industry. Tappi 37, no. 3: 81-3 (March, 1954); *cf.* B.I.P.C. 24: 27-8.

The recommendations of the TAPPI Cable Subcommittee on the selection of wire and cable for the pulp and paper industry are summarized. 2 tables. E.S.

### MACHINERY—CALENDERS

SCHILLER, FRANCIS E. Safety in supercalendering. Pulp & Paper 28, no. 3: 114 (March, 1954).

Most nip accidents on calender stacks occur when the stack is being threaded with a strip of paper or when the stack rolls are being sanded or washed. Directions for safe operations are given. E.S.

SCHILLER, FRANCIS E. Supercalendering story; its development —from ancient to modern times. Pulp & Paper 28, no. 3: 110, 112 (March, 1954).

The history of supercalendering has evolved from the hand burnishing of the ancient Chinese, through the mechanical pressing or glazing hammer and the first calenders, to the modern supercalender with alternate steel and resilient rolls, capable of imparting a smooth surface to eight miles of paper in 15-25 minutes. 1 illustration. R.A.S.

### MACHINERY—CONVERTING MACHINERY

ANON. New fully automatic setup box machine. Boxboard Containers 72, no. 735: 24-6 (March, 1954).

The Auto-Flex, an automatic unit which glues off the wrap, delivers the stayed box, spots the box on the wrap, and feeds the box and wrap into a standard wrapping machine, has been installed on each of two model K wrapping machines at the Servall Paper Box Co., New Brunswick, N.J. An average of 2100 setup-box pieces/hour (either boxes or lids) is produced from each of the machines, which are arranged in parallel and nested, keeping the tandem lineup at a minimum width. The feed mechanism, Flexi-Feed, is a separate unit. 10 illustrations. R.A.S.

JAGENBERG-WERKE A.-G. Roll-coating, impregnating, and laminating machine for laboratory purposes. Das Papier 8, no. 3/4: 57-8 (February, 1954); Wochbl. Papierfabrik. 82, no. 3: 84-5 (Feb. 15, 1954). [In German]

A versatile converting machine on a pilot-plant scale is described, which can be used for one- and two-sided coating, impregnating, dyeing, waxing, pasting, and laminating of paper rolls. 2 illustrations. E.S.

PAPER BOX AND BAG MAKER. Annual machinery review. Paper Box Bag Maker: 19, 21-8, 30-5, 39-43 (Annual no., 1954); *cf.* B.I.P.C. 23: 726.

New machinery in the converting field for paper and board is reviewed. 26 illustrations. R.A.S.

### MACHINERY—CUTTERS

B. T. The trimming of cut paper. Allgem. Papier-Rundschau no. 3: 87-8 (Feb. 5, 1954). [In German]

Although the sheets delivered by the cross cutter on the paper machine should be perfect with regard to size and square angles, this is very often not the case, and many fine paper mills employ cutters in the finishing room to trim the paper piles to exact dimensions and perfectly square corners. A high output and accuracy are demanded of these cutters which are also used by paper converters and printers. They require a solid construction upon a firm foundation; a rapid exchange of knives must be possible. Safety directions must be strictly followed. E.S.

COLEMAN, AL. Cutting cellophane. Graphic Arts Monthly 26, no. 3: 196, 198, 228 (March, 1954); *cf.* B.I.P.C. 24: 553.

The problem of checks or cracks developing at the edge of the sheet just back of the cut when cutting cellophane was eliminated by replacing the regular motor of the paper cutter rated between 1700 and 1800 r.p.m. with another that rated 800 to 900 r.p.m. More suitable knives were also developed from higher grade improved types of steel. Operators of small shops are advised to send out their cellophane cutting. R.A.S.

### MACHINERY—DRIVE

SKINNER, E. S. Application of a differential drive to paper machines. Tappi 37, no. 3: 109-12 (March, 1954).

A new patented differential drive system developed by Beloit Iron Works gears all driven sections of a paper machine to a single line shaft located a short distance above the machine room floor. The line shaft passes through a series of differential units which make possible the extremely sensitive control of draws between sections while maintaining the fixed speed ratios thus established without variation. The application of this new drive system to a variety of Fourdrinier paper machines is stated to have reduced sheet breaks, raised sheet tests, and reduced shrinkage in the sheet width. 5 figures. E.S.

### MACHINERY—DRIVE, ELECTRIC

ANON. Harland drives in paper mills; 1953 installations of particular interest. World's Paper Trade Rev. 140, no. 25: 1892 (Dec. 17, 1953).

Harland Drives Limited has installed a total of 85 new drives in 26 different countries since the end of the war. Some of the 1953 installations include drives in new paper mills in Pakistan, Mexico, and New Zealand. 2 illustrations. E.S.

### MACHINERY—DRYERS

CHALMERS, G. J. Performance testing the dryer section of a paper machine. Pulp Paper Mag. Can. 55, no. 3: 236-43, 273 (Convention issue, 1954).

The author presents a suggested method of organized investigation of the drying process to determine accurately the efficiency of a drier section. The limited extent of recent improvements in this section stems partly from the fact that so little accurate information on present operation is available.

A good deal of preliminary planning must be done before actual tests can start; a complete survey requires time and signifies an expense. Care should be taken that the readings represent average operating conditions on the machine; they should never be taken at or near the time of changing a press felt, drier felt, or wire. All operational data should be taken with as short a time lapse as possible. The author outlines the determination of drying surface, production and evaporation rates, and metered steam consumption, and describes wet-end and dry-end sampling and exhaust- and supply-fan testing, as well as the conductance of a complete temperature survey. Examples for the calculation of the results are included. In striving for increased drying capacity, efforts should be concentrated on the use of less space, more efficient operation, and less power consumption. 4 tables, 1 diagram, and 4 references. E.S.

MCALEAR, J. M. A new paper machine drying control system. Tappi 37, no. 3: 121-4 (March, 1954).

The advantages of the new Mason-Neilan automatic moisture and drying control system are outlined. It employs a pilot drier with a separate source of steam controlled by two pressure instruments and valves mounted in series to maintain the pilot pressure at a set point. Variations in moisture content of the sheet produce a different condensing rate of the pilot drier, and the automatic pressure controller varies the control-valve position to supply the new heat requirement. The system has great stability and holds the moisture control very accurately on a wide variety of paper grades under varying machine operating conditions. When a paper break occurs, a signal light flashes automatically, whereupon the steam pressure is set down to a new value. 6 figures. E.S.

SPOONER DRYER & ENGINEERING COMPANY, LTD., *Ilkley, Yorks., England.* Spooner's new machine for drying gummed and coated papers. World's Paper Trade Rev. 141, no. 3: 222, 224 (Jan. 21, 1954); Paper-Maker (London) 127, no. 1: 9-10 (January, 1954); *cf.* B.I.P.C. 22: 670.

The company's latest development is a compact machine for the drying of gummed and coated papers. The coated paper is conveyed through drying chambers on a series of rollers, with the treated side uppermost. In the case of gummed papers heat is imparted by Spooner nozzles to the untreated side of the sheet to avoid skinning, whereas in the drying of coated papers, the hot air is impinged directly on the coated side. 1 illustration. E.S.

## MACHINERY—ELECTRIC EQUIPMENT

SCHUH, JOHN. Motor applications; case histories; a card system. Pulp & Paper 28, no. 3: 120-1 (March, 1954).

Maintenance of motors at the Longview Fibre Co. is facilitated by the use of a motor pool for temporary replacement while repairs are made, a tickler-card system for checking to locate trouble before it becomes a major repair, and a duplex-card system for a complete record of all motors. 2 illustrations. R.A.S.

## MACHINERY—HOODS

JORDAN, J. C. Report on closed hood installations at Iroquois Falls. Pulp Paper Mag. Can. 55, no. 3: 229-35 (Convention issue, 1954); Paper Trade J. 138, no. 18: 14-19 (April 30, 1954); *cf.* B.I.P.C. 23: 587-8.

The author reports on three closed-hood installations on newsprint machines

after one year of successful operation. The complete enclosure of the drier section and the installation of felt-supply systems, new Grewin systems, and economizers have effected the following: reduced steam consumption/ton of paper; an increase in production by increasing drying rate; recovery of heat in room-supply air, felt-supply air, and process water; reduction in pounds of air necessary to convey the moisture removed from the paper; improved working conditions in the machine room; and the provision of equipment on which experiments can be run to improve operating efficiency and reduce capital expenditures for paper-machine installations. 4 tables, 8 figures, and 3 references. E.S.

### MACHINERY—KOLLERGANGS

AGAHD, KONRAD. Kollergang treatment. Wochbl. Papierfabrik. 81, no. 23: 883-8, 890 (Dec. 15, 1953). [In German]

The historical development of the kollergang, its application in many other industries, its characteristic mode of operation and effects, its advantages and disadvantages, and recent forms in which the principle of the machine is at least partly utilized (Skark kollergang, Curlator, and Haug Kollermill) are discussed. 2 tables and 20 figures. E.S.

### MACHINERY—PAPER MACHINE

LAPINSKI, JOZEF. New trends in designing paper machines. Przeglad Papierniczy 9, no. 1: 4-12 (January, 1953); Papier, carton et cellulose 2, no. 6: 69-72, 75-8 (January-February, 1954). [In Polish and French; the former with Russian and English summaries]

The author reviews the increased machine width and speed of modern paper machines and developments in stock inlets, including pressure inlets, table rolls, suction boxes and rolls, vacuum transfer, driven dandy rolls, and shake, and the use of secondary headboxes on Fourdrinier board machines. Necessary adjustments in stock preparation for high-speed operation are listed. 2 tables and 17 figures. E.S.

### MACHINERY—PAPER MACHINE—EXPERIMENTAL

ANON. Cheaper paper answers. Chem. Week 74, no. 11: 66, 68 (March 13, 1954); *cf.* B.I.P.C. 24: 284.

The possibilities of Parsons & Whittemore's Midget Fourdrinier machine for experimental purposes are outlined. 2 figures. E.S.

### MACHINERY—PIPING

BENDER, B. W. How plastic piping may be used in the pulp and paper industry. Paper Trade J. 138, no. 12: 30, 32, 34 (March 19, 1954); Southern Pulp Paper Mfr. 17, no. 4: 51-4 (April, 1954).

Plastic materials used for piping include polyethylene, cellulose acetate butyrate (Tenite II), vinylidene chloride (saran), polyvinyl chloride, fiberglass-reinforced polyester, and styrene acrylonitrile copolymer blends (Uscolite). The latter has been found especially applicable in the pulp and paper industry for handling air, alum, bleaches, brines, chlorine dioxide bleach, chlorine gas and water, demineralized water, filler dispersion, piping through bleach room, soluble sizing, and wet-strength resin solutions. The ability of Uscolite to withstand the various temperatures and pressures and installation procedures and precautions are discussed. 2 tables. R.A.S.

## MACHINERY—PUMPS

PROCOPI, J. Controlled volume metering. Paper Ind. 35, no. 12: 1320-2 (March, 1954).

Controlled volume pumps are reciprocating-plunger, positive-displacement-type pumps designed for the accurate delivery of a metered quantity of liquid or slurry at some point of the process. Their construction and mode of operation, including manual and automatic regulation, and some pulp- and paper-mill applications are described. 6 figures. E.S.

## MACHINERY—REFINERS

AFLENZER, FRIEDRICH A. Influence of fiberizing variables in producing semichemical pulp. Tappi 37, no. 3: 90-6 (March, 1954).

Aspenwood chips pulped by the neutral sulfite semichemical process were fiberized and refined in a 36-inch, double-disk attrition mill at the Forest Products Laboratory. The principal fiberizing variables—size and moisture content of the chips, water temperature, number of passes, plate clearance, rate of feed, and consistency of the pulp—were examined. It was found that, for best results, the semichemical chips should be predisintegrated to a uniform small size before fiberizing. For a given strength the fiberizing should be carried out in one pass for minimum energy consumption or multi-passes for highest pulp freeness. Further, the chips should have a moisture content of at least 60%, and hot water should be used during fiberizing. At the same production rate bursting strength and tensile strength were higher when the consistency of the pulp between the plates was higher than 10%, but tearing resistance and energy consumption were optimum at about 8-10% consistency. 3 tables, 10 figures, and 5 references. E.S.

ETABLISSEMENTS ALLIBE. A new refiner "Alligator." Papier, carton et cellulose 2, no. 6: 96 (January-February, 1954). [In French]

The construction of a new French conical refiner is described. A hollow plug with circular perforations in its shell rotates in a similarly perforated longitudinally mobile stator shell. Adjustment of the stator shell alters the degree of alignment of the perforations, thereby providing two different circulation systems for the preparation of free or slow stock. 3 figures. E.S.

## MACHINERY—SCREENS

FAHLGREN, SVEN. Screening with the Vibrotor. Pulp Paper Mag. Can. 55, no. 3: 217-18, 223 (Convention issue, 1954).

The construction and advantages of the Vibrotor screen for unbleached and bleached pulps are discussed. The small floor-space requirements and high efficiency are particularly stressed. 1 table and 4 illustrations. E.S.

## MACHINERY—SHAFTS

HEARTZ, FRED. Portable turning lathe assembly. Pulp Paper Mag. Can. 55, no. 3: 270 (Convention issue, 1954).

The first prize in the annual Canadian gadget competition was awarded to a portable turning bar devised to replace filing by hand for removing corrosion from shafts of equipment which cannot be brought to the machine shop. The inaccurate method of hand filing decker shafts used to consume 40 man-hours of labor; the turning bar does the same job with machine-shop precision in six man-hours. 3 illustrations. E.S.

### MACHINERY—SUCTION BOXES

ORTON, S. T., JR. The Rotabelt and its operation. Pulp Paper Mag. Can. 55, no. 2: 67 (February, 1954); *cf.* B.I.P.C. 19: 706.

The construction and mode of operation of the suction unit on board and paper machines are described. 1 illustration. E.S.

### MACHINERY—THICKENERS

THERRIAULT, RAYMOND. Decker cylinder mould rewinder. Pulp Paper Mag. Can. 55, no. 3: 271 (Convention issue, 1954).

The second prize in the annual Canadian gadget competition was awarded to a device for rewinding the decker cylinder mold with which it is possible to rewind a 48 × 131-inch mold in one hour and 45 minutes. 4 diagrams. E.S.

### MATERIALS HANDLING

ÅSTRÖM, JOHN. From the pulp drier to the boat. Svensk Papperstidn. 57, no. 3: 86-91 (Feb. 15, 1954). [In Swedish]

Following a brief introduction on the importance of materials handling in general, the author discusses the processes involved in moving baled pulp from the drier to storage and shipment by boat or barge. Examples are given of the procedures and equipment employed by several pulp mills of Svenska Cellulosa Aktiebolaget (sulfite mills at Ortviken, Essvik, Svartvik, and Kramfors, and sulfate mills at Munksund and Östrand). Cost data are included. 1 table and 15 illustrations. E.S.

FIELDING, JOHN R. A pulpwood flume system. Tappi 37, no. 3: 113-15 (March, 1954); *cf.* B.I.P.C. 22: 265.

A description of the pulpwood flume system installed at Union Bag & Paper Corp.'s Savannah mill, designed for an average capacity of 200 cords/hour, is presented. New developments for this installation include gantry cranes for unloading rack cars into the flume; a truck-dumping arrangement; a rotary pulpwood-distribution table supplying wood to six barking drums; sand, grit, and bark removal equipment; and the application of plows for regulating log feed from the table and drag-chain conveyor discharging to individual barking drums. 4 illustrations. E.S.

LATIMER, ROBERT. New Dixon plant has been planned for progress! Am. Paper Merchant 51, no. 3: 26-7 (March, 1954).

Complete mechanization and a fast accurate communications system were the aim of Dixon & Co., Denver, Col. for their new headquarters plant. Outstanding items of equipment are a teleprinter; central teletype; levelators, manually operated steel deck plate platforms at the dock siding; and a towveyor system, providing driverless movement of goods. 4 illustrations. R.A.S.

MIKKELBORG, G. H. What's wrong with the design and operation of woodhandling in mill yards. Pulp Paper Mag. Can. 55, no. 3: 213-16 (Convention issue, 1954).

The author discusses woodyard operation and layout, with particular reference to stackers (I) and conveyors (II), the results being based on replies received to two questionnaires. The data indicate that there is no standardization of (I) design and that every yard has at least three dif-

ferent types of (II); their capacity is in some cases greater or less than that of (I). As a result of poor layout, many yards have (II) which are duplicated. The need for a systematic study of the entire problem and the possibilities of huge savings by better layouts are stressed. 4 tables and 2 figures. E.S.

## METALLIZING PROCESS

DARLINGTON, L. W. Metallizing unlimited in pulp and paper mills. Pulp Paper Mag. Can. 55, no. 3: 181-3 (Convention issue, 1954).

The use of the metallizing process, spraying molten metal onto a surface to form a coating, for repair work in pulp and paper mills is an accepted practice. The preparation of a surface for metallizing, necessary equipment, and representative applications are described. R.A.S.

## MILL CONTROL

ELLIOTT, NORMAN J. Production planning and control. Chapter 3—Production scheduling methods. Boxboard Containers 72, no. 735: 34-7 (March, 1954); *cf.* B.I.P.C. 24: 557.

Planning and scheduling methods and their accomplishment are outlined in the following steps: (1) checking specified delivery date with customer's requirements card; (2) preparation of a planning copy of the production order; (3) checking supply of needed materials; (4) allocation of production equipment time, beginning with last operation and working backwards; (5) working out time assignment; (6) charting scheduled load; and (7) revisions by planning department. 3 production-control forms. R.A.S.

## MILL MANAGEMENT

ANDERSON, A. S. Management inventory and development. Paper Mill News 77, no. 10: 8, 12 (March 6, 1954). [Abridgment]

The author stresses the importance of strengthening management teams and outlines a program used by Champion Paper & Fibre Co., Hamilton, Ohio for developing employees for management positions which consists of four major areas—organization analysis, selection methods, development and growth, and inventory control. R.A.S.

## MORTARS

HAAS, RUDOLF. Comparative testing of digester cements. Das Papier 8, no. 3/4: 49-52 (February, 1954). [In German; English and French summaries] *cf.* B.I.P.C. 22: 590.

Continuing the previous experiments, five of the digester-cement samples [Höchst SWDZ (I), Asplit A (II), Asplit N (III), Asplit CN (IV), and Plania (V)] were used with somewhat modified procedures. The sixth sample of the former experiments, the Norwegian Welhagen cement, could not be applied under the changed experimental conditions and had to be excluded. Each sample consisted of six ceramic plates between which the mortars were applied in a thickness of 10 mm. The units were left for six weeks in the air-conditioned laboratory, then placed in acid-resistant boxes and hung into sulfite digesters under ordinary cooking conditions. They were removed at intervals, measured, and returned to the digesters until they had been exposed to a total of 100 cooks. Characteristic differences in swelling and shrinking behavior were determined which showed that not all cements are equally suitable for lining sulfite digesters. (I), (IV), and (V) ex-

hibited the desired swelling after they came in contact with the cooking liquor, whereas (II) and (III) showed high initial shrinkage and should be applied with great caution. (I) exhibited considerable shrinkage during the initial conditioning period which indicates that a digester whose bricks are cemented with (I) should not be left standing in a dry condition for any length of time. Highly swelling mortars are most suitable for carbon bricks, and less swelling mortars for ceramic bricks. 12 figures and 3 references.
E.S.

## MUCILAGE

HIRST, E. L., PERCIVAL, E. G. V., and WYLAM, CLARE B. Studies on seed mucilages. Part VI. The seed mucilage of *Plantago arenaria*. J. Chem. Soc.: 189-98 (January, 1954); *cf.* B.I.P.C. 20: 723.

The mucilage from *P. arenaria* seeds is an acidic polysaccharide which gives on partial hydrolysis xylose (12 parts), arabinose (3 parts), galactose (1 part), and 2-*O*-α-D-galacturonosyl-L-rhamnose (1 part). Acetylation, deacetylation, and methylation gave a derivative which on hydrolysis yielded 2,3,4-tri-*O*-methyl-, 2,3-di-*O*-methyl-, 2,4-di-*O*-methyl-, 2-*O*-methyl-, and some unsubstituted D-xylose, 2,3,5-tri-*O*-methyl- and 2,5-di-*O*-methyl-L-arabinose, and 2,3,4,6-tetra-*O*-methyl-D-galactose. No methylated galacturonic acid or rhamnose derivatives were recovered. E.S.

MCCARRON, R. D. Mannogalactan additives in paper. Pulp Paper Mag. Can. 55, no. 3: 190, 200 (Convention issue, 1954).

An automatically controlled continuous cooking system for mannogalactan gums is described which will maintain a constant supply to the paper machine. The additives are being used in a wide variety of papers, including kraft, sulfite, book, coated, and rag papers, also in newsprint and other groundwood sheets. The mucilages impart colloidal properties to the cellulose fibers, which result in strength increases similar to those obtained by mechanical refining. The amount of gum used varies from 5 to 15 pounds/ton based on machine production. 2 tables and 1 diagram. E.S.

WHISTLER, ROY L., and CONRAD, H. E. A crystalline galactobiose from acid hydrolysis of okra mucilage. J. Am. Chem. Soc. 76, no. 6: 1673-4 (March 20, 1954).

By acid hydrolysis of okra mucilage there is obtained a crystalline galactobiose which is shown to be 4-*O*-D-galactopyranosyl-D-galactopyranose. This is the first isolation of a crystalline galactobiose. Its occurrence as a hydrolytic fragment of okra mucilage suggests that 1→4'-glycosidic linkages are present between some of the D-galactose units in the polysaccharide. 7 footnotes. E.S.

## NEWSPRINT—STATISTICS

AMERICAN NEWSPAPER PUBLISHERS ASSOCIATION. Newsprint consumption by states—1953. Newsprint Service Bur. Bull. no. 434: 7 (March, 1954); *cf.* B.I.P.C. 23: 895.

A group of 1437 daily newspapers report an annual consumption for 1953 of 5,289,458 tons of newsprint, 86.1% of the estimated total consumption. New York leads the states in consumption with 888,699 tons, followed by California, Illinois, and Pennsylvania; Wyoming is lowest with 2246 tons. 1 table. R.A.S.

ZIMA, J. J. Newsprint paper in 1953. Paper Mill News 77, no.

8: 127-8 (Feb. 20, 1954); no. 16: 98, 100, 102, 104 (April 17, 1954); World's Paper Trade Rev. 141, no. 9: 671-2, 674, 677-8 (March 4, 1954). [First and third references abridgments]

The production of newsprint in the United States in 1953 amounted to 1,084,000 tons, a decrease of 5.5% from the all-time high of 1952. Canada, which accounted for 84% of the North American total in 1953, produced 5,721,000 tons of newsprint and exceeded 1952's peak by 0.6%. The increase in circulation of magazines and expenditures for advertising in magazines and on radio and television networks are discussed. The over-all activity for 1954 is expected to compare favorably with that in other recent years. 1 table in the first, 5 tables and 2 diagrams in the second, and 2 tables in the third reference. R.A.S.

## NOISE

DAVIS, M. N., and CÁSTON, R. H. Paper mill noise problems. Pulp Paper Mag. Can. 55, no. 3: 201-3, 212 (Convention issue, 1954); Paper Trade J. 138, no. 14: 20, 23, 25 (April 2, 1954); *cf.* B.I.P.C. 19: 855.

Reference is made to a survey of noise sources and noise levels in most of the mills of Kimberly-Clark and its affiliates; the background of the development of suction-roll silencers is presented. In the company's creped wadding mills the use of these silencers has eliminated most of the suction-roll noise, reducing the over-all loudness in the mills by 40-90%. Applications of the silencers to book and newsprint machines have reduced the noise; however, in some cases operating difficulties have resulted from their use. The authors believe that some combination of silencer gap, length, and box position can be found by further studies which will silence all suction rolls and still not interfere with machine operation. 5 figures and 2 references. E.S.

## PACKAGING

ANON. The frozen dinner is back. Modern Packaging 27, no. 7: 134-5, 325 (March, 1954); *cf.* B.I.P.C. 17: 377.

A frozen dinner, ready to heat and serve, is packaged in a heavy aluminum foil dinner plate, covered with foil, and sealed in a special lamination of tissue and cellophane which is reverse printed in six colors. The outer covering is a paper-board folding carton. 5 illustrations. R.A.S.

ANON. General Electric's 'sell.' Modern Packaging 27, no. 7: 154-6, 320 (March, 1954).

The folding paperboard carton used by General Electric Co. for packaging clocks can be refolded to form an open display holder with a platform base. Similarly, the company uses a display platform for three clocks as partitioning in the shipping container. 10 illustrations. R.A.S.

ANON. Packaging automation. Packaging Parade 22, no. 254: 58-60 (March, 1954).

The package which The Mail Pouch Tobacco Co., Wheeling, W.Va. designed for its Kentucky Club pipe tobacco consists of a flexible pouch laminated of glassine, foil, and polyethylene; a folding carton of plain chipboard; and a reverse-printed overwrap of cellophane, with a tear strip opening. The packaging operation is described. 9 illustrations. R.A.S.

ANON. Recent Swedish progress in the use of paper bags. Rev. papiers et cartons 17, no. 1: 27 (Jan. 1, 1954). [In French]

The retail packaging of sugar and flour in paper bags of different sizes; the shipment of drinking glasses in tight-fitting bags stiffened with a corrugated board, a cushioning material consisting of wood wool enclosed in a kraft-paper tube wound around heavy or fragile articles prior to their insertion into multiwall bags; and "Kraftfoil" bags for the packaging of hygroscopic foodstuffs are described. E.S.

FOOD ENGINEERING. One-portion packets gaining. Food Eng. 26, no. 3: 89-90, 132, 135 (March, 1954).

The increasing number of food items being included, new materials used, and the factor of customer acceptance in the trend toward packaging in one-portion packets are discussed. 5 illustrations. R.A.S.

MINNEMAN, E., and HILL, J. F. How frozen food bundling can reduce costs. Food Eng. 26, no. 3: 78-81, 130, 132 (March, 1954).

The use of multiple-unit packing rather than shipping cases for frozen foods is being tested. Savings were realized in warehouse handling, materials used, and operational costs. A special wrapper was developed of Vapotite, two sheets of laminated creped kraft with a low water-vapor-transmission rate, high wet-strength value, and imbedded with a criss-cross web of glass fibers. 2 tables and 8 figures. R.A.S.

ZIEMBA, JOHN V. Flexibles are revamping package pattern. Food Eng. 26, no. 3: 70-4, 126, 128, 130 (March, 1954).

New materials, machines, and techniques and increasing customer acceptance, which are causing the growing trend to flexible-type packaging, are discussed. 20 illustrations. R.A.S.

## PAPER—COATED

HAGEN, GUSTAV. Plastics for paper coating. Allgem. Papier-Rundschau no. 2: 46-51 (Jan. 20, 1954). [In German]

A review is presented of modified natural products (cellulose and rubber derivatives) and fully synthetic plastics (polymerizates and mixed polymerizates), which are at present used as coatings in the paper industry. The principal methods of application and the resulting effects are also listed. 1 table and 25 footnotes. E.S.

## PAPER—CONVERSION

ANON. Enso-Gutzeit's paper sack mill. Finnish Paper and Timber 4, no. 9: 108-9 (December, 1953). [In English]

A brief description of the new unit at Kymi is given where kraft multiwall open or valve bags are manufactured from a maximum of six plies. An impregnating machine, primarily for the manufacture of bitumen paper, has also been installed. 3 illustrations. E.S.

## PAPER—FILLERS

CUSHING, MERCHANT L. The use of starches as aids in the production of papers containing mineral fillers. Pulp Paper Mag. Can. 55, no. 3: 163-5 (Convention issue, 1954).

The author discusses the use of starch to increase filler retention (I) with particular mention of the Rowland and Pattiloch processes. The amount of

starch required to hold strength and promote (I) is a controversial point which needs to be examined by each mill in its own operation. From 0.5 to 7% has been used; normally 2-3% would seem the economical range. The point of addition may be during the beating cycle or following the jordan (fan pump). Tabulated data of the results obtained during mill runs are included. 5 tables and 2 references. E.S.

## PAPER—MERCHANDISING

CROCKER, DOUGLAS A. Merchants can beat 'direct' selling of many toilet grades. Paper & Paper Products 95, no. 17: 2, 20-1 (March 5, 1954); *cf.* B.I.P.C. 24: 564.

Following a review of the history of the production of various grades of toilet tissue, the author summarizes the present situation of distribution. Sales to the United States government are directly from the manufacturer; sales to other governmental agencies are partly direct and partly through paper merchants; sales to private industry are mainly through paper merchants; and retail selling, now mostly in supermarkets, mainly direct. Possibilities for paper merchants competing in the latter field are emphasized. 1 table and 1 figure. R.A.S.

## PAPER—PERMANENCE

LANGWELL, W. H. The permanence of paper. Part III. Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 30, no. 6: 170-5 (December, 1953); *cf.* B.I.P.C. 22: 839-40.

Additional inhibitors ("complexing agents") (I) for suppressing the catalytic action of metals in the oxidation of atmospheric sulfur dioxide in the substance of the paper were tested under somewhat modified and accelerated conditions than those employed in the previous reference. The paper samples were moistened and kept in the glass jars for seven instead of 28 days. The most interesting (I) were: ethylenediamine tetraacetic acid (II), potassium ferrocyanide (III), sodium dihydrogen pyrophosphate (IV), potassium oxalate (V), and sodium citrate (VI), although each of these has its own inherent disadvantages. In tests with different paper samples, (II) consistently gave the best results, (III) and (IV) were only slightly inferior to (II), (VI) was distinctly inferior, and (V) appeared to be without useful effect. Strawboard containing calcium carbonate gave an anomalous result with (II). Since under conditions of low acidity, the oxidation of sulfur dioxide can take place fairly rapidly in the absence of catalysts, (II) offered no protection. With regard to the amount of (I) required in practice, consideration must be given to the fact that the samples in the aging test contained about six times the amount of normal moisture. It is probable that the amount of (I) required to combine with the catalytic metals in most commercial papers will be small compared with the amount which will have to be added, since an excess will usually be necessary. 1 table and 1 reference. E.S.

NEDERVEEN, G. VAN, and ROYEN, A. H. H. VAN. Durability of chemical pulps as judged by artificial aging. Papeterie 75, no. 12: 797, 799, 801, 803, 805, 807-8 (December, 1953). [In French]

The permanence (durability or stability) of 24 different pulps was judged by applying methods of artificial aging followed by determining changes in certain pulp properties. Bleached sulfite, unbleached and bleached kraft pulps, and various pulps made from rags, linters, and straw were tested. They were beaten to about 50° S.-R., formed into sheets and, in each case, the

folding endurance (I) and brightness (II) were determined. Sheets from the same stocks were then aged at 100°C. for three days, one and two weeks, and at 120° for two and three weeks. After conditioning at 20° and 65% R.H., (I) and (II) were again determined and the losses were noted. The authors discuss in some detail why log. (I) is more significant than (I) itself. The results involving (I), despite being somewhat scattered, showed certain trends; e.g., pulp from linters showed the least loss in (I)—although admittedly (I) prior to aging was much lower than that of many wood pulps. Certain wood pulps showed as great a permanence as did those of rag stock. Kraft pulps bleached with chlorine dioxide were more permanent than those bleached with hypochlorite. Long heating especially at 120° caused serious losses in (I). Gaged by each of the two tests (I) and (II), the pulps were arranged in their order of permanence and, although this was not identical in the two series, the trends were similar; an approximately linear relationship exists between the ratio of log. (I) (after aging) to log. (I) (before aging) and the loss in (II) termed yellowing. No generalizations are possible; pulps of one type are not necessarily more durable than are those of a different origin. Gaged by losses in (II), some bleached kraft pulps showed a high stability which seemed to be increased by chlorine dioxide bleaching. 3 tables, 5 figures, and 7 references. L.E.W.

## PAPER—PHYSICAL PROPERTIES

DR. M. The relationship between paper-sheet properties and the morphology of the wood fiber. Wochbl. Papierfabrik. 81, no. 23: 875-83 (Dec. 15, 1953). [In German]

This is essentially a resume of the findings of other investigators concerning the factors influencing sheet strength, although no individual references are given. The maximum strength of a pulp after sheet formation from any vegetable fibous material obtained by any given process is determined by a number of factors which depend upon the morphological structure of the fiber and its chemical composition. Although fiber length is important, it is not as significant as originally assumed; the ratio of fiber length to width and the thickness of the cell wall play a far more decisive role. Examples depicting the differences between spring- and summerwood and coniferous and deciduous trees and the resulting sheet properties are given. With regard to chemical components, the lignin present in bleached and unbleached pulps always represents a decrease in strength; its content should therefore be kept as low as possible. An increase in strength by delignification can only be realized when the fiber is not degraded by the treatment; hence, the final step in bleaching (i.e., when the protective lignin layer has been largely removed) should always be a mild one. The hemicelluloses should be present in an optimum amount at which they exert a bonding effect without causing slippage between the fibers and a decrease in adhesion. The D.P. should not fall below 1000-1500. The temperature in the drier part is significant to the extent that higher drying temperatures cause an increase in irreversible hornification of the cellulose and a decrease in the reactivity and swelling properties of the fibers. Jayme and Rothamel's attempts to characterize pulp quality by introducing the "quality number" and "over-all" or "total quality number" (*cf.* B.I.P.C. 13: 181-2) are mentioned. 8 tables and 15 figures. E.S.

RUNYAN, O. H. Know your papers; paper properties and their limitations. Inland Printer 132, no. 6: 47 (March, 1954).

The author states that if one paper characteristic is increased in a sheet, usually at least one or even more of the others are decreased or changed. Six paper properties (alkaliproofness, brightness, cushion, folding endur-

ance, formation, and gloss) are described briefly, and the effect of increases in these properties on other paper characteristics is pointed out. R.A.S.

### PAPER—SHEET FORMATION

FIEBIGER, HARALD. The fundamentals of paper manufacture. Wochbl. Papierfabrik. 80, no. 23: 878, 880, 882 (Dec. 15, 1952); 81, no. 7: 227-30; no. 10: 340-4 (April 15, May 31, 1953); 82, no. 1: 7-9; no. 5: 147-50 (Jan. 15, March 15, 1954). [In German]

This is an extensive review of the present knowledge of the mechanical processes involved in sheet formation upon the Fourdrinier wire; the results of investigations and theories scattered over a wide period in the technical literature of many different countries have been critically evaluated and screened. The following items are covered: fiber orientation in flowing pulp suspensions; flocculation; the empirical determination of rate of flow from headbox to wire; the shake and its influence upon fiber deposition during sheet formation; the effect of the couch, the wet presses, the draws, and the drying process upon the strength properties in the machine and cross-machine directions of the paper web; and the interaction of the physical effects upon sheet formation and paper manufacture. 12 tables, 2 figures, and 103 references. E.S.

TUTT, RICHARD, JR. Sveen glue. Pulp Paper Mag. Can. 55, no. 3: 171-2, 178 (Convention issue, 1954); *cf.* B.I.P.C. 24: 380.

This is essentially the same article as given in the previous reference, although it is slightly expanded. 1 table and 3 references. E.S.

### PAPER—VISCO-ELASTICITY

SÈVE, R., and PERRIN, H. Dynamic measurements of the modulus of elasticity in paper. Assoc. tech. ind. papetière, Bull. no. 1: 1-7 (1954). [In French]

Young's modulus of elasticity (I) was measured with an apparatus (II) using a resonance frequency which is described with appropriate sketches. (II) has the advantages of insuring rapidity and good precision, and of using paper strips 5-10 cm. in length and 0.5-1.0 cm. in width. The results agreed with those of Steenberg (*cf.* Tappi 34, no. 11: 126A, 128A [November, 1951]). (I) decreased markedly as the surrounding humidity increased and rose noticeably when the paper was moistened and then dried without tension. When tension was applied during drying, (I) increased sharply. The greater the initial wetting, the greater was the increase in (I). The importance of (I) is discussed, and results are given for (I) determinations in the cross-machine and machine directions and with strips cut at various angles. 5 tables, 13 figures, and 6 references. L.E.W.

### PAPER AND PULP INDUSTRY

AMERICAN PAPER & PULP ASSOCIATION. Wisconsin has most pulp and paper makers. Pulp & Paper 28, no. 3: 106 (March, 1954).

Statistics are presented showing that more pulp and paper mill employees live in Wisconsin than in any other state—25,993, or 9.7% of the industry's nationwide work force. New York is second with 25,824 employees and has the most mills, 103. Wisconsin is fourth in number of mills, having 48. 1 table and 1 map. R.A.S.

ANON. New Zealand's growing pulp-paper industry. World's Paper Trade Rev. 141, no. 8: 593-4 (Feb. 25, 1954); *cf.* B.I.P.C. 23: 820.

With reference to the official opening of the Kinleith Pulp and Paper Mills of New Zealand Forest Products, Ltd., the important part which integrated projects from forest to finished product are playing in the economy of the country are mentioned. The Tasman Pulp and Paper Co. is launching the Murupara scheme (*cf.* B.I.P.C. 21: 326) involving a sawmill and pulp and newsprint mill expected to be in operation by 1956. New Zealand's production potential and marketing prospects are also outlined. E.S.

ANON. Spain—forest resources and forest industry. Norsk Skogind. 8, no. 2: 43-8 (February, 1954). [In Norwegian]

Statistical data on Spain's forest resources and domestic lumber, pulp and paper, and wallboard industries, including production, consumption, exports, and imports, are given. 6 tables. E.S.

BATES, JOHN S. Life begins at forty. Pulp Paper Mag. Can. 55, no. 3: 152-5 (Convention issue, 1954); Can. Pulp Paper Ind. 7, no. 4: 102, 104, 106, 108 (April, 1954).

On the occasion of the 40th Annual Meeting of the Technical Section of the Canadian Pulp & Paper Association, the author discusses fundamentals in the pulp and paper industry and their effect on the future of the industry, including the forest resources of Canada, work in conservation, utilization of additional grades and species of wood, increase in consumption, use of sawmill waste, emphasis on research, and employee relations. 1 table. R.A.S.

BOYCE, CHARLES W. Pulp and paper in 1954. Paper Mill News 77, no. 10: 16-18 (March 6, 1954).

A 1954 prospect of about the same volume of production as in 1953 is predicted; this amounts to more than 26 million tons in paper requirements. However, competition in the industry is expected to be greater because of the increased capacity resulting from wide expansion and improvement. The volume and marked stability of wood pulp and various grades of paper and board are discussed individually. R.A.S.

CHEMICAL ENGINEERING. Paper eyes cellulose supply. Chem. Eng. 61, no. 3: 195 (March, 1954); *cf.* B.I.P.C. 23: 566.

Developments in the pulp and paper industry in the United States during 1953, including research activities, are reviewed. 1 illustration. E.S.

CRAIG, J. A. The state of the industry . . . in British Columbia. Can. Pulp Paper Ind. 7, no. 3: 62, 64 (March, 1954).

The 1953 total production of the pulp and paper industry in British Columbia amounted to 1,103,053 tons; newsprint production reached an all-time high of 493,943 tons, which represents 44.8% of the total tonnage. General industry statistics of the province and a comparison of pulp, paper, and newsprint productions for the period 1940-53 are presented. 3 tables and 1 diagram. R.A.S.

FOWLER, R. M. A long look ahead. Pulp Paper Mag. Can. 55, no. 3: 134-7 (Convention issue, 1954); Can. Pulp Paper Ind. 7, no. 4: 110, 112, 114, 116, 118 (April, 1954); *cf.* B.I.P.C. 23: 566.

The year 1953 is summarized as a peak year for the Canadian pulp and paper industry in total tonnage, gross value of production, numbers employed, progress in research and forest conservation, and many other ways. Digressing from his annual report analyzing the statistics showing this progress, the author rather discusses some of the problems all major industries in Canada and particularly the pulp and paper industry will be facing in the next two or three decades. General changes in population, industrial development, world importance, government regulations, labor relations, and international tension are covered; the role of the businessman in advancing progress is especially emphasized. The problem of the United States reaching self-sufficiency in the production of newsprint is considered. R.A.S.

FOWLER, R. M. C.P.P.A. president's report for the year 1953. Pulp Paper Mag. Can. 55, no. 3: 137-40, 406 (Convention issue, 1954); Can. Pulp Paper Ind. 7, no. 4: 52, 54, 56, 58, 60, 62, 64 (April, 1954); *cf.* B.I.P.C. 23: 566.

Over-all production of Canadian mills in 1953 amounted to 9.3 million tons, 2% greater than in 1952. The pulp and paper industry was the leading single manufacturer in Canada in expenditures on plants and equipment; $180 million was spent on plants of which $110 million was paid out for new construction, machinery, and equipment. Canada continued to lead the world in total volume of pulp and paper exported; exports of newsprint and pulp increased slightly over 1952. Exports of book and writing paper, fine paper, wrapping paper, and paperboard were lower, but consumption was raised by an increased demand in the domestic market. Newsprint output totaled 5.7 million tons; shipments to the U. S. were 26,000 tons higher than in 1952. Progress during the year in research, forest conservation, labor-management relations, and the Woodlands Section, the Technical Section, and other activities of the association are summarized. 3 tables. R.A.S.

OLMSTED, GEORGE, JR. The tasks ahead of us. Tappi 37, no. 3: 22A, 24A, 26A (March, 1954); Paper Mill News 77, no. 8: 100, 102, 104 (Feb. 20, 1954).

The replaceability of the raw material, low cost, and widespread use are listed as reasons for an increase of 240% consumption of paper products in a period when the population of the United States increased only 44%. To continue this curve the author recommends aggressive merchandising, low costs of manufacture, and new products, applications, and diversification of operations. R.A.S.

PACKARD, ROLAND A. The pulp and paper industry in the Far East. Tappi 37, no. 3: 38A, 40A, 42A, 44A, 46A, 48A, 50A, 52A (March, 1954).

The author summarizes the position of the pulp and paper industry in the countries of the Far East; in comparison with a 400-pound per capita consumption in the United States, the consumption in Japan is 35; Formosa, 7; the Philippines, 9; Indo-China, 0.7; Thailand, 2.8; South Korea, 2; and Red China, 1.9 pounds. Mills, machinery, materials, and production in these countries are discussed. 4 tables and 8 illustrations. R.A.S.

PORTER, REED R. Market pulp outlook. Paper Mill News 77, no. 8: 107-8 (Feb. 20, 1954).

Total United States consumption of market pulp in 1953 was 2,500,543 tons, an increase of 11% over 1952; this increase was greater than the corresponding increase of the industry as a whole, but failed to come anywhere

near the 1950 and 1951 tonnage figures. North American producers provided 1,934,000 tons or 78% of the total market pulp supply, a net increase of 100,000 tons toward the goal of self-sufficiency in North American pulp production. Statistics are presented on the consumption of market wood pulp by grade and by types of mills; emphasis is placed on the trend to fast-growing southern and western varieties of wood and on the rise in the use of hardwood pulp. 2 tables and 2 diagrams. R.A.S.

### PAPER AND PULP INDUSTRY—EDUCATION

PRINGLE, GEORGE H. The technical man in the pulp and paper industry. Tappi 37, no. 3: 10A, 12A, 14A (March, 1954); Paper Mill News 77, no. 8: 50, 52 (Feb. 20, 1954).

The increase in the number of technical men required in the pulp and paper industry, attributed to the mechanization and speed-up of the industry and the realization by top management that technical training provides a good all-around background, is expected to continue. Ways in which more potential technical personnel can be attracted to the industry and training in the plant to stimulate and sustain interest are described. R.A.S.

### PAPER AND PULP INDUSTRY—PUBLIC RELATIONS

ANON. American Cyanamid Company salutes pulp and paper industry. Southern Pulp Paper Mfr. 17, no. 3: 72, 74 (March, 1954); Paper Mill News 77, no. 8: 37 (Feb. 20, 1954); Paper Trade J. 138, no. 9: 88, 90 (Feb. 26, 1954); Paper & Twine J. 28, no. 1: 10, 16 (March, 1954).

A brief description is given of the telecast "Life with paper" presented for the first time by the company on Feb. 17, 1954. To dramatize the role played by paper in every-day life, the show featured scenes in a supermarket, a typical office, and a kitchen at home, as well as a fashion show in which Melostrength-paper apparel was shown. Reference is also made to the first public showing of the Midget Fourdrinier (*cf.* B.I.P.C. 24: 284) at the Hotel Commodore in New York during Paper Week; this machine was also included in the telecast program. 1 illustration in the first two and fourth references and 9 in the third. E.S.

### PAPER AND PULP MILLS

ANON. Converting expansion strengthens Sorg. Pulp & Paper 28, no. 3: 62, 64-5 (March, 1954); *cf.* B.I.P.C. 23: 342.

The expansion in product development, technical, and manufacturing departments of the Sorg Paper Co. at Middletown, Ohio is discussed; converting equipment was purchased in order to convert an increasing portion of the company's paper production. Recently developed specialty papers include such grades as saturating, twisting, match stick, tracing, gasket, steel wrap, glass interleaving, pattern board, water-repellent kraft laminating, corrugated-coated bag paper, and wet-strength kraft. The description of the equipment is similar to that in the previous reference. 7 illustrations. R.A.S.

ANON. K-C (Munising). Tappi 37, no. 3: 116-18A (March, 1954).

A history of the Munising Paper Co., Munising, Mich. from its beginning in 1902 to its acquisition by Kimberly-Clark in 1951 and its present status is given. E.S.

ANON. New Elk Falls additions. Pulp & Paper 28, no. 3: 115-16 (March, 1954); *cf.* B.I.P.C. 23: 113, 114.

Several important installations are being made at the new Elk Falls newsprint mill at Duncan Bay, Vancouver Island, B.C., including a vacuum transfer on the paper machine and two additional Great Northern grinders. The biggest handling problem at the mill involves the transport of short logs from the woodroom to the groundwood mill, for which purpose flumes were adopted instead of the customary cable-and-button conveyors. The general understanding is that a sulfate pulp unit will be the next major addition to the mill. 4 illustrations. E.S.

ANON. New Zealand's first kraft mill. Paper Trade J. 138, no. 12: 26, 28 (March 19, 1954); *cf.* B.I.P.C. 23: 820.

The kraft paper mill of New Zealand Forest Products Ltd. at Kinleith which went into operation late in 1953 is described. The building was designed to withstand earthquakes. Details of the installations, including a Walmsley Fourdrinier paper machine for a maximum finished trim width of 120 inches and designed for speeds up to 1150 f.p.m., are given. 3 illustrations. R.A.S.

CARDEW, JOHN. New Zealand inaugurates its first integrated pulp and paper mill. Pulp Paper Mag. Can. 55, no. 2: 44-8 (February, 1954); *cf.* B.I.P.C. 23: 820.

A description of the sulfate, bag-paper, and linerboard mill of New Zealand Forest Products Ltd. at Kinleith is given; paper production began in November, 1953 and the mill was officially opened on Feb. 20, 1954. 6 illustrations. R.A.S.

PAPIER, CARTON ET CELLULOSE. The mill at Lancey of Papeteries de France. Papier, carton et cellulose 2, no. 6: 49-52 (January-February, 1954). [In French]

The development of the mill from a small groundwood mill built in 1868 by Aristide Bergès to the present combination of a groundwood mill, sulfite mill, five-machine paper mill, and one-machine board mill is described. 8 illustrations. E.S.

TURNER, JOHN S. Unceasing modernization evident as editor tours 13 mills in Toronto-Niagara Falls area. Pulp Paper Mag. Can. 55, no. 2: 58-61 (February, 1954).

Brief summaries are given of recent improvements at Acme Paper Products Co. Ltd., Toronto; Alliance Paper Mills Ltd., Merritton; Beaver Wood Fibre Co. Ltd., Thorold; Brantford Felt and Paper Co. Ltd., Thorold; Dominion Cellulose Ltd., Toronto; Don Valley Paper Co. Ltd., East York; Gair Company Canada Ltd., Toronto; Garden City Paper Mills Co. Ltd., Merritton; Interlake Tissue Mills Co. Ltd., Merritton; Ontario Paper Co. Ltd., Thorold; Provincial Paper Ltd., Thorold; Thorold Pulp Co.; and Welland Pulp Products Ltd., Thorold. 2 illustrations. R.A.S.

## PAPER AND PULP MILLS—WATER SUPPLY

GEHM, H. W., and MOGGIO, W. A. Conservation of water in the kraft pulp and paper industry. Tappi 37, no. 3: 158-61A (March, 1954).

Water usage/ton of product in the kraft pulp and paper industry has declined steadily to a remarkable degree in the past 20 years. Present-day kraft pulp and paper mills are capable of operating successfully by utilizing 20,000-30,000 gal. of water/ton of pulp. The basic factors through which decreases in water consumption were brought about are the re-use of process water, the introduction of new types of equipment, and improvements and economies in manufacturing operations. Flow diagrams are included which show that water re-use in a kraft mill is a complex and intricate undertaking which involves a great deal of study and planning. It cannot be accomplished overnight but is a gradual undertaking, depending on many influencing factors. The decrease in water consumption/ton of product was accompanied by a corresponding decrease in fiber and salt cake losses and a marked decrease in the pollutional load discharged to the water courses. 3 tables, 6 flowsheets, and 10 references. E.S.

## PAPER SIZING

FOULON, A. Montan wax sizes. Wochbl. Papierfabrik. 81, no. 23: 896 (Dec. 15, 1953). [In German]

The preparation of the size, addition to the beater, applications to different paper grades, and the resulting properties of the products are described. E.S.

## PAPER SPECIALTIES

ANON. Branded industrial wraps. Modern Packaging 27, no. 7: 169-71 (March, 1954); *cf.* B.I.P.C. 19: 792; 24: 207.

The advertising value of trademarking of interior and exterior papers in the industrial field is emphasized; the versatility of rotogravure and flexographic processes has made possible the printing of many grades of paper. The small cost differential between plain and trademarked papers is almost always offset by the resultant saving in wrapping, stenciling, and labeling costs. 6 illustrations. R.A.S.

ANON. Impregnating agents for packaging purposes. Allgem. Papier-Rundschau no. 1: 18-20 (Jan. 7, 1954). [In German]

A number of German products (Skinophan, Acronal, Lutofan, Antaqua, etc.) and their suitability for imparting waterproofness, water-vaporproofness, greaseproofness, or wet strength are discussed. 5 tables. E.S.

ANON. Sign of the times. Chem. Week 74, no. 10: 22 (March 6, 1954).

A graph depicts the shift in American preference from glass to cartoned milk containers. In 1936, one glass bottle was produced for 0.2 paper container; this has increased in 1954 to one glass bottle for 18.8 paper containers. This shift has an impact on the chemicals used in their manufacture; sales of soda ash, limestone, feldspar, and various coloring agents for producing glass bottles are falling steadily, whereas sales in waxes and adhesives used in the manufacture of paper containers are increasing correspondingly. 1 diagram. E.S.

BERNDT, KURT. Art and chromo papers. Allgem. Papier-Rundschau no. 1: 16-17 (Jan. 7, 1954). [In German]

The author outlines the essential qualities of a good body paper, the principal pigments and adhesives used for the coating, possible defects (picking and pinholes) and their avoidance, and the advantages of a good coated paper for printing. E.S.

DAY, FREDERICK T. Heat-seal labelling. Brit. Packer 16, no. 2: 110-11, 115 (February, 1954); *cf.* B.I.P.C. 24: 216-17.

A description of heat-seal papers and processes is presented. 4 illustrations. R.A.S.

DAY, FREDERICK T. Labelling by means of pressure sensitive paper. Paper Box Bag Maker: 25-6, 28 (January, 1954); *cf.* B.I.P.C. 24: 41.

The description of pressure-sensitive labeling is essentially the same as Part 4 of the previous reference. 3 illustrations. R.A.S.

DAY, FREDERICK T. Metal foils, bronzes and metal lined papers and boards. Paper Box Bag Maker: 60-1, 64 (February, 1954).

The various forms, methods of manufacture, and uses of metal papers are discussed under the headings: foil manufacture, adhesive coating and bronzing, metal papers obtained by printing, metal-lined papers, lamination or combining, and a survey of metal varieties. 1 illustration. R.A.S.

FLEISCHER, HERBERT [Moderator] What's new at the Forest Products Laboratory in the field of wood, paper, resin combinations? J. Forest Products Research Soc. 4, no. 1: 22-9 (February, 1954).

Topics of discussion at a panel which covered some potential new products in the field of wood, paper, and resin combinations were as follows: the papers, impregnating resins, and treating processes used to make overlay sheets; overlaid veneer, plywood, and lumber products; particle boards; uses of paper-overlaid panels; and painting of these panels. 4 illustrations. R.A.S.

GEISER, WILLY. The protection of safety papers. Rev. papiers et cartons 16, no. 24: 6, 8, 11 (Dec. 15, 1953). [In French]

Processes for preventing alterations on documents, bank checks, postal money orders, currency paper, etc. without risk of detection are reviewed, including intricate watermarks, the use of dyed fibers, the incorporation of sensitive chemicals, certain fluorescent agents, etc. Most processes are kept secret and frequently more than one protection is applied. E.S.

HALL, CARL W. Paper vs. glass. Food Eng. 26, no. 3: 101-2 (March, 1954).

Th author reports on a survey carried out in eight dairy plants located in Michigan to determine whether or not there is justification in charging an extra cent for milk in paper cartons. Although the cost of carton and operations is higher than with glass because of their single use, other factors decrease cost and should be considered, particularly the reduced cost of supervision. 4 figures. R.A.S.

KOTTE [HANS] "Mellotex," a Scotch offset paper with two top sides. Allgem. Papier-Rundschau no. 1: 23 (Jan. 7, 1954). [In German]

A brief description of the manufacture of a printing paper with two uniform sides—obtained by couching two webs with their wire sides together—is given. The paper is produced by Tullis, Russel & Co., Ltd. from an esparto and bleached wood-pulp furnish. 1 diagram. E.S.

[KOTTE, HANS] Typewritten copies without carbon paper? Allgem. Papier-Rundschau no. 3: 99-100 (Feb. 5, 1954). [In German]

Reference is made to a new German process "Autoscript paper" which combines the effect of the copying paper and carbon tissue in one, thereby eliminating the latter. The paper stock is dyed a rather deep color, and the front side of the sheet (which is turned toward the typewriter keys) is coated with a very thin layer of a white crystalline wax. The impact of the typewriter key with this layer melts the wax at the points of contact, so that the letter becomes visible in the dark color of the body stock and stands out clearly against the white background. The advantages and disadvantages of the new paper are discussed. The melting point of the wax layer is around 60°C.; the paper should therefore not be exposed to direct sunlight or come in contact with heated surfaces. E.S.

NATIONAL PAPER TRADE ASSOCIATION. Basic product data about gummed tape. Am. Paper Merchant 51, no. 3: 20-1 (March, 1954).

The various types of gummed tape are described, and definitions and miscellaneous information on basis weights, rolls, commercial delivery, marking and labeling, specifications, and shipping regulations are presented. R.A.S.

PAPER SALES. A review of what's new for '54. Paper Sales 14, no. 3: 14-19, 44, 46, 48, 50, 52, 54 (March, 1954); *cf.* B.I.P.C. 23: 656.

The annual review of new paper products which were introduced this spring by mills and converters is presented. 25 illustrations. R.A.S.

THOMPSON, J. F. New developments in silicone treated papers. Paper, Film and Foil Converter 28, no. 3: 22-3 (March, 1954).

Various weights of kraft and glassine papers treated with an organic silicone (DC-1107, manufactured by Dow Chemical Co.) produce a release paper which is nontoxic, water repellent to a certain extent, and able to stand heat well above the decomposition of the paper. The paper is being used in the rubber, steel, food, candy, and container industries. The future potential of silicone-treated papers appears promising. R.A.S.

## PARANÁ PINE

ROGERS, L. J. Reforestation of Paraná pine. Unasylva 8, no. 1: 15-18 (March, 1954).

Possibilities of natural and artificial regeneration, research required, and the need for reforestation are discussed in a report on the Paraná pine (*Araucaria angustifolia*) of Brazil. 1 illustration. R.A.S.

## PATENTS

ANON. Echoes of the past; improvements in the manufacture of paper. World's Paper Trade Rev. 140, no. 25: 1933-4, 1938 (Dec. 17, 1953).

The original text of William Broadbent's specification A.D. 1847, no. 11833, covering a vacuum suction box, is presented. E.S.

## PHYSICAL TESTING—PAPER

LONG, HENRY R. Control instruments for offset lithography. Natl. Lithographer 61, no. 1: 26-36 (January, 1954).

In the fourth article in a series on control instruments for lithography, the author covers glossmeters, ink and paper control instruments, and the estimation and checking of ink coverage and consumption. Following a general discussion, individual instruments are described very briefly, including apparatus for measuring and testing gloss, ink transmission, color fastness, reflectance, wet-film thickness, ink tack, viscosity, pick, vapor permeability, relative humidity, moisture content, sizing, basis weight, bursting strength, tear, stiffness, etc. 36 illustrations. R.A.S.

## PHYSICAL TESTING—PAPER—POROSITY

POURADIER, J., and CHATEAU, H. Method for measuring the pore diameter of a paper. Assoc. tech. ind. papetière, Bull. no. 1: 8-10 (1954). [In French]

Both dry papers (I) and swollen wetted papers (II) were studied. The method for determining the average pore diameter (III) depends on the minimum pressure (IV) required to force an air bubble through a strip of paper surmounted by an organic liquid in the case of (I), or water in the case of (II). The organic liquids must have a reasonably low surface tension (V), should not swell (I), and have a relatively low vapor pressure at room temperature. About 10 liquids proved suitable, but carbon tetrachloride was the most satisfactory. The very simple apparatus made entirely of glass used for determining (III) is described. (III) (in microns) = [3 (V) (in dynes/cm.)]/(IV) (in cm. of mercury). The results are reproducible to within ± 8-12% and serve to characterize a specific paper. Great increases in (III) were noted when a sample was moistened and swollen; these findings are discussed. 3 tables and 3 figures. L.E.W.

## PHYSICAL TESTING—PAPER—VAPOR TRANSMISSION

DR. M. The water-vaporproof package. Allgem. Papier-Rundschau no. 1:13-15; correction: no. 4: 139 (Jan. 7, Feb. 20, 1954). [In German]

The author draws attention to the confusion existing in Germany with regard to the term water-vaporproof; with reference to the PATRA method for measuring water-vapor permeability (WVP) (*cf.* B.I.P.C. 18: 860), to date the most generally used method in Europe, he shows that the values obtained depend upon a number of factors, particularly temperature, R.H. range, size of sample tested, etc. The values obtained by different methods for different products can neither be compared nor converted. Examples are given to illustrate that mere WVP values without specifying the size of the sample and the method by which they were obtained are meaningless. 4 tables. E.S.

## PHYSICAL TESTING—PULP

CLARK, JAMES D'A. Mill control of beating and refining. Tappi 37, no. 3: 140-2A (March, 1954); World's Paper Trade Rev. 141, no. 7: 548, 550, 553 (Feb. 18, 1954).

Following a somewhat popular description of the structure of a typical cellulose fiber, an outline of the beating effects on wood pulp is given, followed by a list of the more currently available tests for the changes caused

by beating and notes on the characteristics of these tests. Three simple experiments to illustrate the inferiority of the freeness test (I) are described, and the general drawbacks of (I) are discussed. A scheme providing more reliable information about the treatment the stock has received in the beater involving the use of a high-speed classifier is suggested (*cf.* B.I.P.C. 19: 183). E.S.

### PHYSICAL TESTING—PULP—BRIGHTNESS

CHADEYRON, L. The whiteness of pulps and their yellowing. Assoc. tech. ind. papetière, Bull. no. 1: 21-30 (1954). [In French]

Difficulties in measuring the brightness of wet pulps are discussed, especially when values determined with a Pulfrich or Quéré photometer are compared with those of a Photovolt apparatus. Accelerated aging tests by the use of heat (I) (preferably at 120°C.), with ultraviolet light (II) using a Galloistype lamp, and on exposure to direct sunlight in midsummer are described. The latter technique proved entirely unsatisfactory. Results of using (I) and (II) are given for a bleached kraft pulp, a prehydrolyzed kraft (dissolving) pulp, a soft easy-bleaching sulfite, and a hard but readily bleached sulfite pulp. Techniques used in bleaching and the aging tests are described; the data are tabulated and discussed in some detail. The main yellowing effect of (I) is that of the "condensation" of compounds formed in the bleaching operation—usually in an unsatisfactory bleach, leading to cellulosic products with aldehyde groups. The principal effects of (II) are those resulting from oxidizing the "residues" (III) remaining in a pulp after a kraft cook. The effects of (II) are catalyzed by small amounts of iron. *A priori*, no methods for determining lignin serve to furnish any useful information on the possible effect of (II) on (III). 11 tables and 6 figures. L.E.W.

### PHYSICAL TESTING—PULP—SWELLING

RYUKHIN, N. V., and YANCHENKO, L. N. Determination of the swelling of pulps in water and solutions of alkali. Bumazh. Prom. 28, no. 11: 13-17 (November, 1953). [In Russian]

For abstract *cf.* C.A. 48, no. 6: 3681 (March 25, 1954). 1 table, 9 figures, and 7 references. E.S.

### PHYSICAL TESTING—WAX

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Sealing strength of paraffin wax. Tappi 37, no. 3: 165-6A (March, 1954).

The text of TAPPI Suggested Method T 642 sm-54 is presented. It covers a method for measuring the sealing strength of wax when tested on a standard paper specimen under standard conditions of temperature and humidity and under defined conditions of preparation and sealing of the test specimen. The apparatus, materials, test specimen, and procedure are described. 2 diagrams. E.S.

### PHYSICAL TESTING—WOOD

KITAZAWA, GEORGE. Some non-destructive tests for wood. J. Forest Products Research Soc. 4, no. 1: 18-20 (February, 1954).

Some present and potential nondestructive methods of testing wood are reviewed, particularly visual inspection, radiography, magnetic metal detectors, surface roughness tests, surface stresses, color tests, slope of grain and hardness, radioactivity, electrical moisture meters, and vibration tests. 25 references. R.A.S.

## PITCH TROUBLES

GUSTAFSSON, CHARLEY. Pitch troubles caused by sulfite pulp. Norsk Skogind. 8, no. 2: 54-9 (February, 1954). [In Swedish; English summary] *cf.* B.I.P.C. 22: 850.

A short account of investigations on pitch troubles which have been carried out at the Central Laboratory in Helsingfors, Finland is given. The same apparatus as in the previous study was used; principally unbleached pulp suspensions were agitated in a copper vessel under controlled conditions, and the amount of pitch deposited on the walls and stirrer after two hours' agitation was determined. Pulp suspensions in distilled water showed little tendency for deposition of harmful pitch (I) at a pH below 6; this tendency increased rapidly above pH 6 and reached a maximum at pH 9, whereupon it decreased again. The 150 unbleached pulp samples investigated showed no great differences in (I) deposits below pH 6, whereas at pH 7, the results varied between 50-1400 mg. As a rule it was found that pulps which deposited more than 200 mg. of (I) in the testing apparatus gave serious pitch troubles in mill operations. In the presence of aluminum sulfate in a concentration of about 50 mg./liter, (I) deposition reached a maximum at pH 5 and decreased at pH 7. Hard process water is often held responsible for pitch troubles. The present results indicate that at a given constant pH the calcium and not the bicarbonate ions in the water increase the amount of (I) deposited on the walls. Most of the investigated dispersing agents recommended for controlling pitch troubles (Lissatan, Tamol, Cartan, Diadavin, etc.) have a positive effect at a pH 7 in hard water, but not in soft water. Hexametaphosphate and ethylenediamine tetraacetate, on the other hand, were found effective in both hard and soft waters. The influence of sodium bisulfite and petroleum additions was also investigated, and their beneficial effect was established. 2 tables, 11 figures, and 1 reference. E.S.

## PRINTING AND PRINTER'S INK

ANON. The causes and cures of mottling. Indian Print & Paper 19, no. 2: 40; no. 3: 39 (October, 1953; January, 1954).

A printed film of ink which lacks uniform appearance (mottling) may be the result of defects in the ink, paper, or equipment. Various types of mottle are described and traced to the possible cause. R.A.S.

K. J. B. Water-dried ink. Ind. Eng. Chem. 46, no. 3: 15-16A, 18A (March, 1954).

With reference to odor problems involved in printing food packages with oil inks, the advantages of moisture-set inks are pointed out; these evolve no odor at the time of printing or thereafter. A brief outline of the process and the components of heat-set inks is given. Through water absorption by the ink system, the glycol (or other hygroscopic solvent)-soluble resin becomes insoluble and is precipitated along with the pigment while the liquids diffuse into the paper stock. Probably the easiest method of drying moisture-set inks is to take advantage of the moisture naturally present in most paper stocks (corrugated board, kraft paper, carton stocks, etc.). With the use of auxiliary sources of moisture, such as steam or water sprays, press speeds of over 1000 f.p.m. become possible. Instantaneous drying, freedom from odor, ability to withstand temperature extremes, and the unusual toughness of the moisture-set film have made these inks favorites of the package printer and manufacturer; in addition, they do not form a skin, a problem of the small printer with short runs at which time no full can of ink is consumed. 1 illustration. E.S.

### PRINTING AND PRINTER'S INK—ANILINE PROCESS

LECRAW, JOHN E. The place of flexography in the graphic arts. Graphic Arts Monthly 26, no. 3: 68, 70, 72, 74, 76 (March, 1954).

The use of flexographic printing in the United States was recognized primarily with the advent of cellophane; its suitability for this product stimulated progress in improving machinery and inks. Resulting improvements expanded the printing to paper bags, cups, napkins, carbon paper, and gummed and pressure-sensitive tapes. Fundamentals in the press and the printing operation are summarized. R.A.S.

SENGEWALD, KARL-HEINZ, and WANTZEN, H. Progress in aniline printing. Brit. Printer 66, no. 395: 36-8 (March-April, 1954).

The author discusses the versatility of flexographic printing and points out important factors in the production of the rubber stereo plates. A description is given of the Olympia multicolor aniline press manufactured by Windmöller & Hölscher of Lengerich-i-W, Germany. 7 figures. R.A.S.

### PULP—REACTIVITY

MALM, C. J., BARKEY, K. T., MAY, D. C., and ABELL, P. I. Acetylation reactivity of cellulose containing salts. Ind. Eng. Chem. 46, no. 3: 557-61 (March, 1954).

Prior to acetylation it is customary to activate the cellulose with acetic acid; the ease of this acetylation depends, in part, upon the previous history of the cellulose, including its purification. The cellulose often contains various amounts of salts, depending upon the type of final wash water used during its processing. Sodium, calcium, and magnesium carbonates, and sulfates are commonly found in commercial acetylation-grade cellulose. These salts were found to increase the minimum activation time of the pulps; their solubilities in acetic acid correlated with these increases in minimum activation times. The bicarbonates or carbonates readily diffused out of the cellulose as soluble acetates and as a result had little effect, whereas the sulfates increased the minimum activation time of the pulp to a much greater extent because of their greater insolubility in acetic acid. Magnesium sulfate, being the least soluble, had the greatest effect. No evidence was found that the salts contributed to the degradation of the pulp during drying. 5 tables, 6 figures, and 2 references. E.S.

### PULP STONES

PERRY, JAMES H. Recent developments in Norton pulpstones. Paper Mill News 77, no. 12: 89 (March 20, 1954).

Two major developments in Norton pulpstones are described briefly; the one involves the new G Bond and the other the self-centering, inverted-bevel flange which has become standard on all Norton pulpstones. 2 figures. E.S.

### PULP WASHING

KLEIN, MAURICE, and RALSTON, JOHN M. Wash water and wash water heating. Tappi 37, no. 3: 124-8 (March, 1954).

The requirements of the wash water used on the diffusers and pulp washers at the Savannah plant of the Union Bag & Paper Corp. are presented. The system for heating the hot wash water is described with illustrations. The digester blow steam is condensed directly with the fresh water make-up in

jet condensers. The instrumentation of the system is designed to control the temperature of the hot water to the washing equipment, accumulate the maximum amount of heat, and control the flow of fresh-water make-up. A discussion of the operating difficulties encountered and steps taken to correct some of these difficulties are presented. Waste heat from an evaporator surface condenser is used to heat part of the water supplied to the hot water system. Other sources of waste heat are available if the need for additional heat should arise. 1 table, 4 figures, and 4 references. E.S.

PERKINS, J. K., WELSH, H. S., and MAPPUS, J. H. Brown stock washing efficiency; displacement ratio method of determination. Tappi 37, no. 3: 83-9 (March, 1954).

The washing accomplished by the showers on the multistage countercurrent rotary vacuum filter brown stock washing system can be expressed as a ratio of the actual reduction of soluble solids across the shower zone of each stage compared with the maximum possible reduction. These ratios, termed "displacement ratios," are a function of the dilution factor and, within the normal operating range, are independent of other variables except pulp characteristics and specific loading. By using these ratios in a stepwise material balance, the washing can be expressed by a single equation: $S_w = \Pi R(1 \rightarrow m)S_b$; where $S_w$ is equal to the percentage of soluble solids in the liquor leaving the system with the washed pulp; $S_b$ is the percentage of soluble solids in the blow liquor; and $\Pi R(1 \rightarrow m)$ is the product of the solids reduction ratios of each of the stages. 7 figures and 3 references. E.S.

## RAMIE

WILLIAMS, C. H. Ramie. Chemurgic Dig. 13, no. 2: 16 (February, 1954).

Following an outline of the properties of ramie fiber, the author describes Huntclub, a fabric for garments made by Swift Manufacturing Co., Columbus, Ga. and composed of a blend of cotton, rayon, and ramie (all spun). R.A.S.

## RAW MATERIALS

THE ECONOMIST INTELLIGENCE UNIT, *London.* Paper's new raw materials. Unasylva 8, no. 1: 3-7 (March, 1954).

Possibilities for expanding facilities for the manufacture of pulp and paper in order to meet future growing requirements of the world were examined. It was concluded that the supply of raw materials would be ample with the utilization of tropical hardwoods, bamboo cane, bagasse, straw, and other various agricultural residues; a variety of pulping processes is available for their conversion. The economic factors involved in setting up new plants in undeveloped areas are discussed. R.A.S.

NATIONAL RESOURCES (TECHNICAL) COMMITTEE WORKING PARTY ON PULP PRODUCTION. The production of cellulose pulp from Commonwealth raw materials. Colonial Plant and Animal Products (London) 3, no. 4: 331-41 (1952-3).

There is no immediate prospect of the United Kingdom being able to import pulp from within the Commonwealth, except from Canada, from which supplies are limited by exchange difficulties. Many raw materials exist within the colonies which can be converted into pulp; tropical hardwoods, plantation-grown softwoods, bagasse, bamboo, papyrus, cereal straws, and grasses are

considered. Whether or not it would be possible to produce pulp from them which could compete in the open market with Scandinavian wood pulp involves economic and supply issues, which require a detailed study in relation to specific projects, each of which is likely to present unique features. In general, the cost of building and operating a pulp mill in an undeveloped country is likely to be high, and freight rates from many colonial areas would be heavy. Colonial hardwoods and most other raw materials do not yield pulps equal in quality to commercial softwood pulps. For such reasons it might be preferable in areas where there exists a sufficiently large local market to build a small integrated pulp and paper mill to supply local requirements rather than to attempt to produce market pulp. As a long-term development, consideration should be given to the advantages of afforestation with quick-growing timbers of known good pulping characteristics; surveys of colonial resources of forest and fibrous raw materials should be initiated as soon as possible. 4 tables and 9 references. E.S.

## RAYON

DOMLEO, A. Fibres manufactured from cellulose—production. Rev. Textile Progr. 4: 154-71 (1952).

The author reviews the literature published during 1952 on the production of cellulose fibers, including sections on viscose rayon, cellulose acetate, and staple fibers. 116 references. R.A.S.

## RAYON—STATISTICS

TEXTILE OR'GANON. U. S. rayon & acetate cellulose consumption. Textile Or'ganon 25, no. 3: 38-40 (March, 1954); *cf.* B.I.P.C. 23: 576.

Total consumption of cellulose by the United States rayon and acetate producing industries in 1953 was 589,100 short tons, an increase of 7% over 1952 but still 4% below the record high of 1951. Wood pulp accounted for 89% of all cellulose consumed; the 522,000 tons represented a new high in tonnage and percentage share. The 11% share remaining for linters pulp amounted to 67,100 tons, the smallest percentage of total pulp used on record. A total of 481,000 tons of cellulose was consumed in the production of viscose and cupra rayon, of which 87% was wood pulp and 13% linters pulp. The acetate process used a total of 108,100 tons of which 94% was wood pulp and 6% linters pulp. The rayon and acetate industries accounted for 60% of the total consumption of the supply of dissolving and special alpha grades of wood pulp last year, and for 41% of the production of linters pulp. 1 diagram. R.A.S.

## RAYON—VISCOSE PROCESS

VOSTERS, H. L. Filterability of viscose. V. Svensk Papperstidn. 57, no. 4: 122-40 (Feb. 28, 1954). [In English; German and Swedish summaries] *cf.* B.I.P.C. 22: 201.

The Hagen-Poiseuille law applies to the filtration of viscose within certain limits. The filtration process depends upon a number of factors which are subject to constant variations during the entire process. The author attempted the development of a general filtration law at constant pressure and constant rate of flow. By means of his equations it should become possible to calculate different special cases of filtration. The equations are also applicable to the filtration of other cellulose derivatives and solutions of high polymeric substances. Certain relationships between the standard and the general filtration laws are discussed. A new clogging constant is proposed which takes the

influence of the initial rate of flow into consideration. The influence of the percentage of cellulose, sulfur, alkali, and impurities in the viscose and the γ-number (number of carbon disulfide molecules/100 glucose units) before and after ripening on the filtering properties was investigated; the initial γ-number and the pulp impurities (ash and resin) were found to exert the greatest influence on filterability. A test is proposed for evaluating the filtering properties of a filter material in comparison with a standard material. 10 tables, 24 figures, and 27 references. E.S.

### RESEARCH

AYROUD, A.-M. The Central Laboratory at Helsinki. Papier, carton et cellulose 2, no. 6: 57-8 (January-February, 1954). [In French]

The organization of research at the Finnish institution is described. 1 diagram. E.S.

PARSONS, JOHN L. Research Appropriations Committee. Tappi 37, no. 3: 94A, 96A, 98A (March, 1954); *cf.* B.I.P.C. 23: 539.

Reference is made to the previously published compilation of TAPPI research grants since 1935 (*cf.* B.I.P.C. 24: 223); the requests and grants made during 1953 are summarized in a table. Brief progress reports of current committee projects financed by TAPPI research grants are presented. 1 table. E.S.

### RESEARCH LABORATORIES

ANON. Forest Biology Laboratory, Fredericton, N.B. Canada. Pulp Paper Mag. Can. 55, no. 2: 76-8, 80, 82-3 (February, 1954).

The new laboratory, built on the campus of the University of New Brunswick, serves as headquarters for research and survey work on forest zoology and pathology in the four Canadian Atlantic provinces. Projects being carried out at the present time include a continuous forest insect and disease survey, ecological studies, biological control, disease of living trees, and physiology and anatomy of trees. 1 map and 20 figures. R.A.S.

GRANTHAM, JOHN B. The Oregon Forest Products Laboratory. J. Forest Products Research Soc. 4, no. 1: 14-17 (February, 1954).

A description of the laboratory is presented, including sections on the advisory committee, financial support, administration of the program, physical facilities, laboratory staff, scope of the research program, major research projects (extractives from Douglas-fir bark, manufactured products from wood residues, testing of wood roof and wall diaphragms, vapor-drying studies, and western hardwood utilization), co-operation, and advisory services. 3 figures. R.A.S.

ZIEMBA, JOHN V., and SLATER, LLOYD E. How Kraft's package lab works. Food Eng. 26, no. 3: 82-5, 87, 136 (March, 1954).

The work of the packaging research laboratory of the Kraft Foods Co. is described; aims of the laboratory and testing equipment employed are listed. 10 illustrations. R.A.S.

### SAFETY

HALE, B. W. Three steps toward a mill safety program. Fibre Containers 39, no. 2: 101-2 (February, 1954).

The author believes that any plant can be successful in reducing accidents if management wants a safe plant and says so, a lively interested safety committee is on the job, and interest in safe working is constantly stimulated. R.A.S.

JOHNSON, F. W. Recovery of wood from block pile. Pulp Paper Mag. Can. 55, no. 2: 106, 111, 113 (February, 1954).

The author reviews progress made in the safe wood recovery from the block pile; hazards have been overcome by the use of mechanical rakes and grapplers and safety equipment (steel toe caps in rubber boots, safety helmets, and shin guards) for workers. R.A.S.

## SCIENCE

PIRIE, GEORGE W. Current reflections. Science in papermaking. Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 30, no. 6: 154-6 (December, 1953); *cf.* B.I.P.C. 24: 379.

Advances in science or technology can only be put to productive use by alterations in materials, methods, or machinery. This means that the scientist must work much more in the mill than in the laboratory, except for routine testing, if scientific knowledge is to be put more into practice in the future and the role of science in the management team is to be raised. 4 references. E.S.

## SEMI-CHEMICAL PULPING PROCESS

CONVERSE, C. WILLIAM. High yield pulping—an estimate of the future. Tappi 37, no. 3: 156-7A (March, 1954).

The author reviews the trends in high-yield pulping (any process giving a yield of over 50%) in the different sections of the country and predicts further considerable increases in these methods and their applications in the future; his predictions are based on raw-materials economics. 1 table. E.S.

DORLAND, R. M., LEASK, R. A., and MCKINNEY, J. W. Neutral sulphite cooking of hardwoods. Pulp Paper Mag. Can. 55, no. 3: 258-62 (Convention issue, 1954).

The results of some systematic studies of neutral sulfite semichemical cooking of hardwoods [aspen (I) and mixed hardwoods (II), i.e., aspen, white and yellow birch, and soft and hard maple] are presented. When (I) was used alone, it was found that yield drops when cooking time is increased, but not with increasing chemical concentration. Brightness may actually decrease with prolonged cooking, but increases with increased chemical concentration; the permanganate number decreases both with time and concentration. The burst factor shows a maximum at about 20% chemical, based on wood, whereas the tear factor gives a corresponding minimum. The refining power required to reach a definite freeness drops with increasing cooking chemical, but reaches a minimum at 20%. The power drops at first, but later increases with cooking time, showing that the chips reach a minimum hardness and then get harder with prolonged cooking. (II) show many of the same tendencies in cooking, but give a somewhat higher yield, higher permanganate number, and lower brightness. In contrast to (I), brightness does not change with cooking time. The burst factor is lower, but tear is higher in (II) than in (I); maximum burst seems to result from a lower cooking chemical concentration than required for (I). Refining power is lower for (II) which can also be cooked longer without showing any hardening tendency. 6 tables, 12 diagrams, and 11 references. E.S.

## SHIPPING CONTAINERS

ANON. Fir sprouts a sturdy branch. Monsanto Mag. 34, no. 1: 29 (January-February, 1954); *cf.* B.I.P.C. 23: 826.

The description of Ply-Veneer manufactured at Weyerhaeuser's Springfield, Ore. plywood plant is essentially the same as that in the previous reference. 1 illustration. R.A.S.

ANON. Only one interior packing piece instead of five formerly needed. Packaging Parade 22, no. 254: 98-9 (March, 1954); Fibre Containers 39, no. 3: 112, 114 (March, 1954).

By using a corrugated shipping container designed with extensions on the end flaps to form partitions, the number of packing pieces required for porcelain insulators was reduced. 3 illustrations in the first and 2 in the second reference. R.A.S.

## SHIPPING CONTAINERS—MULTIWALL BAGS

ANON. The hygienic sack. Bowater Papers no. 3: 47-53 (1954).

A general summary of multiwall bags is presented; various types of bags and treatment for protection against problems of heat, moisture, grease, pests, and sifting are discussed. 9 illustrations. R.A.S.

## SMALL ORDERS

THIES, ROBERT. No commissions on small orders. Paper Sales 14, no. 3: 22-3, 54, 56 (March, 1954).

An attempt to prevent losses incurred by the processing of small orders at Herbert A. Post, Inc., New York, proved successful; a minimum of $10 on all orders, with reasons thoroughly explained to salesmen and customers, was advantageous to both. R.A.S.

TOOMEY, ANNE. How the paper merchants of New York City handle small orders. Am. Paper Merchant 51, no. 3: 24-5, 90-1 (March, 1954).

Paper merchants in the New York area give a number of reasons for the volume of small orders. These include the large variety of papers offered and advertised by the manufacturer, the size of the mill package, purchase made for each job and not for inventory, and the lack of assistance from the sales force in obtaining orders of sufficient size to yield a profit. Solutions are given for eliminating these items and thereby reducing profitless small orders. 2 tables. R.A.S.

## SODA ASH

CHEMICAL ENGINEERING. Natural soda ash. Chem. Eng. 61, no. 3: 342-5 (March, 1954).

A pictured flowsheet of the new Westvaco plant at Westvaco, Wyo., now in full-scale operation, is presented. It produces 300,000 tons of refined soda ash from trona ore per year. 1 flowsheet and 6 illustrations. E.S.

CHEMICAL ENGINEERING. Soda ash is ready. Chem. Eng. 61, no. 3: 208 (March, 1954); *cf.* B.I.P.C. 23: 580.

The expansion in soda ash production during 1953 is listed; tabular data on consumption by different industries (pulp and paper ranks fourth with 330,000 tons) and on other chemicals are included. 2 tables and 1 illustration. E.S.

## SODIUM ALUMINATE

BERG, HARVEY B. Sodium aluminate non-fibrous raw material. Pulp Paper Mag. Can. 55, no. 3: 187-9 (Convention issue, 1954); *cf.* B.I.P.C. 17: 505-6.

The use of sodium aluminate of improved quality and stability as a coagulant on the paper machine for better sizing results with coarse and fine papers and in white water clarification is discussed. Examples of correct applications are given with data on possible size and alum reductions. 4 tables, 3 figures, and 1 reference. E.S.

## STAINS AND STAINING

NOBÉCOURT, P., and MAZEN-PAPIER, M. TH. Modifications in the color reactions given by lignified tissues pretreated with various chemical reagents. Assoc. tech. ind. papetière, Bull. no. 1: 11-13 (1954). [In French]

Microtome sections of spruce-, chestnut-, beech-, and poplarwood were pretreated with such reagents as aqueous sodium hydroxide, hydrogen peroxide, chlorine water, chlorine in carbon tetrachloride, and nitric acid, and then tested by using the aniline sulfate and phloroglucinol reagents, the Mäule reaction, a stain (I) comprising a mixture of Iodine green and Alum carmine, and in certain instances Combes' reagent. The results are discussed in some detail. Usually the colorations with (I) were the most persistent. 3 references. L.E.W.

## STARCH

MURAKAMI, HIDEO. Electronic structure of the amylose-iodine complex. J. Chem. Phys. 22, no. 3: 367-74 (March, 1954).

The electronic structure of the amylose-iodine complex is studied on a different basis from that of the previous Stein-Rundle theory (*cf.* B.I.P.C. 18: 633). First, the electron transfer from amylose oxygen to the iodine molecule is discussed from the viewpoint of Mulliken's intermolecular charge-transfer spectra. Then it is shown that the consideration of electronic interaction between neighboring iodine molecule ions and bond formation between oxygen and iodine gives a reasonable interpretation of bond number and absorption spectra. Last, the quantitative discussion of absorption spectra is performed by the application of the free-electron model to the system ($I_4^-$) which is considered to be the elemental unit in the polyiodine chain. The agreement between predicted and observed results is satisfactory if the extreme simplification of the model is taken into account. 1 table, 2 figures, and 26 footnotes. E.S.

PENICK & FORD, LTD., INCORPORATED. Penick & Ford, Ltd. announce new continuous starch cooker. Paper Mill News 77, no. 11: 14, 28 (March 13, 1954); Paper Trade J. 138, no. 10: 28, 30 (March 5, 1954); Fibre Containers 39, no. 4: 102-3 (April, 1954).

The company announces a new machine for the continuous and automatic preparation of cooked starch; it is anticipated that the unit, tentatively called the Hygelator, will find application in the paper industry for the preparation of starch for beater or furnish sizing, for tub and calender sizing, and for coating colors. 3 illustrations in the first and third and 1 in the second reference. R.A.S.

## STATISTICAL METHODS

WHITE, D. O., and METHERELL, E. C. Application of statistical quality control to process operations at the Manitoba Paper Company. Pulp Paper Mag. Can. 55, no. 3: 219-23 (Convention issue, 1954).

The application of statistical quality control to the plotting of process control tests on wall charts is described. Satisfactory control limits were worked out statistically, based on optimum periods of operation, and the operators were instructed how to use them as guides in their operations. Prior to this, the supervisory personnel was in the habit of setting up arbitrary control limits based on personal opinion as to the kind of control believed desirable. In many instances these limits were extremely narrow; it is shown that they were sometimes even narrower than the normal variation caused by testing errors alone. Although machine operating efficiencies have improved considerably during the past two years since this system has been in use, no credit is claimed for it. However, it is noteworthy that the operators have shown complete co-operation and have given unsolicited assurances of their appreciation of this system which they consider a better tool than the one previously employed. 1 table, 2 diagrams, and 3 references. E.S.

## STEAM POWER

UNITHERM LTD., *Hayes, Middlesex, England.* The automatic control of paper mill boiler plant. World's Paper Trade Rev. 141, no. 8: 609-10, 612, 614, 616, 621 (Feb. 25, 1954).

The UniTherm system of automatic boiler control and applications to shell-type boilers and large water-tube units are described. 5 figures. E.S.

## STRAW

BAUMANN, EUGEN. Paper from straw. Wochbl. Papierfabrik. 81, no. 23: 893-4 (Dec. 15, 1953). [In German]

The author, an engineer in the field of precision mechanics without the slightest knowledge of papermaking, describes his experiences with producing paper from straw as a Russian war prisoner. The paper was needed for records in the camp. Although no equipment of any kind was available, the ingenuity of a group of prisoners finally succeeded in preparing about 50-60 handmade sheets of white ink-resistant paper per day. E.S.

MARCHLEWSKA-SZRAJEROWA, JADWIGA. More about straw. Przeglad Papierniczy 9, no. 10: 300-3 (October, 1953). [In Polish]

For abstract *cf.* C.A. 48, no. 5: 3027 (March 10, 1954). 8 tables and 6 references. E.S.

PETERSON, G. A. An American looks at Holland's straw pulp industry. World's Paper Trade Rev. 140, no. 27: 2026 (Dec. 31, 1953); *cf.* B.I.P.C. 24: 213.

The section on Holland is reprinted from the original article on the European pulp and paper industry. E.S.

## SUGARS

THOMPSON, A., ANNO, KIMIKO, WOLFROM, M. L., and INATOME, M. Acid reversion products from D-glucose. J. Am. Chem. Soc. 76, no. 5: 1309-11 (March 5, 1954).

By employing successive carbon and silicate chromatography, the disaccharides gentiobiose, isomaltose, cellobiose, maltose, sophorose, and β,β-trehalose have been isolated, as their crystalline octaacetates, in an acid reversion mixture from D-glucose. There were also contained levoglucosan triacetate and a previously unreported disaccharide octaacetate of unknown structure. 1 table and 26 footnotes. E.S.

### SULFATE MILLS

ANON. An ERP-reconstructed pulp mill. Paper Ind. 35, no. 12: 1318-19 (March, 1954).

The reconstruction of the obsolete sulfate mill at Frantschach, Austria is described by means of 8 illustrations. E.S.

CHAPMAN, KENNETH. Start-up problems at a new kraft pulp mill. Tappi 37, no. 3: 136-9A (March, 1954).

The author discusses the problems involved in assembling the crew, starting the equipment, and streamlining the operations in the different departments of the new bleached sulfate mill at Everett, Wash. of the Weyerhaeuser Timber Co. (*cf.* B.I.P.C. 24: 483). E.S.

### SULFITE MILLS

CANADIAN PULP AND PAPER INDUSTRY. Port Alice . . . an exciting augury. Can. Pulp Paper Ind. 7, no. 3: 12-14, 16-18, 20, 22, 24, 26, 28, 30 (March, 1954); *cf.* B.I.P.C. 24: 576.

The extensive modernization program of the sulfite dissolving pulp mill of Alaska Pine & Cellulose Ltd. at Port Alice, Vancouver Island, B.C. is described under the headings: Clean chips from clean pulp, p. 14, 16; Power economy is the question, p. 16-17; Near automation, p. 18, 20, 22, 24, 26; and Nature's blessing—pure water, p. 28, 30. More detail than in the previous article is presented. 1 map and 12 illustrations. E.S.

### SULFITE PROCESS

SMIRNOW, ANATOL. Effect of digester liquid relief on the sulfite pulping process. Przeglad Papierniczy 9, no. 11: 334-7 (November, 1953). [In Polish]

For abstract *cf.* C.A. 48, no. 5: 3027 (March 10, 1954). 2 tables and 11 references. E.S.

ZHEREBOV, L. P. The sulfite cooking of spruce. Bumazh. Prom. 28, no. 5: 8-13; no. 9: 6-14; no. 11: 5-9 (May, September, November, 1953). [In Russian]

For abstract *cf.* C.A. 48, no. 6: 3684 (March 25, 1954). 34 tables, 9 figures, and 21 footnotes. E.S.

### SULFITE PROCESS—AMMONIA BASE

CROWE, GORDON A. Conversion to the ammonium bisulphite pulping process. Tappi 37, no. 3: 154-6A (March, 1954).

The advantages of the ammonium bisulfite pulping process are mentioned; the merits of an ammonia test are discussed and the results of a recent test presented. Equipment modifications for either a temporary or a permanent installation are described, and recommendations for storing and handling

ammonia are given. Since ammonia attacks copper alloys, all copper, bronze, and brass in contact with the liquids containing ammonia will have to be replaced. Slime formation is somewhat aggrevated, but can be controlled by the application of suitable slimicides. 3 figures and 1 reference. E.S.

### SULFITE PROCESS—MAGNESIUM BASE

ROGERS, CHARLES E. The sulphite pulping industry and conservation of natural resources. Pulp Paper Mag. Can. 55, no. 2: 55-7 (February, 1954).

The sulfite industry is a large consumer of oil and sulfur, the natural supplies of which are not inexhaustible. Of all sulfite processes investigated to date, the magnesium-base sulfite process offers the best possibilities for chemical recovery and avoidance of stream pollution. 5 references. E.S.

### SULFUR

CHEMICAL ENGINEERING. Sulfur, acid continue their rise. Chem. Eng. 61, no. 3: 192-3 (March, 1954); *cf.* B.I.P.C. 23: 586.

Although mined sulfur decreased somewhat, total sulfur from all sources was up during 1953; at present sulfur seems to be in ample supply. Wood pulp is listed as the principal nonacid user of sulfur and pyrites. Sources and disposition of sulfur for 1952-53 are reviewed. 1 table. E.S.

ROYALITE OIL COMPANY, LTD., *Alberta, Canada.* Sulfur recovery from waste gases. Heat Eng. 29, no. 1: 18-21 (January-February, 1954).

A description is given of the process for recovering sulfur from the hydrogen sulfide gas present in petroleum and natural gas at the Turner Valley plant of the company, using the two-stage Foster-Wheeler system. The sulfur produced is 99.5% chemically pure; the plant has a capacity of 30 long tons of sulfur/day. 1 flowsheet and 4 illustrations. R.A.S.

### SULFUR DIOXIDE

ANSUL CHEMICAL COMPANY, *Marinette, Wis.* Liquid $SO_2$ cuts down time on sulphur burners. Paper Mill News 77, no. 13: 12, 17 (March 27, 1954).

The use of liquid sulfur dioxide (I) during unavoidable shutdowns of sulfur burners for repairs is suggested for the pulp and paper industry. Although the cost of (I) may be slightly higher than the operation of a burner, it is considerably less than the cost of shutting down production during the repair period. A similar substitution of (I) for burner gas during a reconstruction period in the starch industry is described. 1 illustration. E.S.

### TAILINGS

WETMORE, R. T. Refining of mill wastes for newsprint. Pulp Paper Mag. Can. 55, no. 3: 175-8 (Convention issue, 1954).

The author describes the "refiner-center" layout and associated equipment at The Ontario Paper Co. Ltd. Refining is carried out at low consistency, and the stock is pumped to the refiners. All sulfite knots, bull-screen waste, and groundwood rejects are handled in this system, at a total power consumption of 50 h.p. days/ton. Accepted stock has strength equal to or better than No. 1 groundwood, but poor color, and is used in the newsprint furnish, or

alternatively can be diverted for wrapper furnish. Data are included showing the bursting strength developed at various freeness and power required to refine to 300 freeness at various refining consistencies. 1 table and 5 figures. E.S.

### TESTING, GENERAL

GRIFFIN, ROGER C. Report of Standards Committee for 1953. Tappi 37, no. 3: 90A, 92A (March, 1954); *cf.* B.I.P.C. 23: 587.

The activities of the committee during 1953 are reviewed, including new and revised standards and changes in personnel. The need for cutting the time lag between the development of a standard and its actual publication is emphasized. 3 tables and 16 references. E.S.

### TEXTILE INDUSTRY AND FABRICS—TESTING

MEREDITH, R. Physics and physical testing. Rev. Textile Progr. 4: 9-35 (1952); *cf.* B.I.P.C. 23: 543.

A review of the year's progress in the physics and physical testing of fibrous materials is presented under the following headings: fine structure—x-rays, electron microscope, optical microscope, and miscellaneous; moisture relations—sorption and swelling; mechanical properties—strength, load-extension curves, elasticity and time effects, resistance to creasing and flexing, and friction; optical, electrical, and soiling properties; fabric geometry, permeability; and instruments and test methods—fiber length, fiber fineness, moisture, mechanical properties, resistance to abrasion, yarn regularity, etc. 205 references. R.A.S.

### TURPENTINE

MIROV, N. T. Chemical composition of gum turpentines of pines of the United States and Canada. J. Forest Products Research Soc. 4, no. 1: 1-7 (February, 1954).

The turpentine composition of all but two American pines growing north of the Mexican border is presented in tabular form. The tabulation is preceded by a brief critical review of the present status of information on the subject. There are some 40 species of pines in the United States and Canada; eight are common to both countries. The actual number depends on the individual attitude of an investigator in recognizing or not recognizing certain pines as independent species. The two pines whose turpentines have not as yet been investigated are *Pinus arizonica* and *P. remorata.* The former, which grows chiefly in Mexico, is generally considered to be a variety of *P. ponderosa;* the latter is found on the islands off the coast of California. 1 table and 30 references. E.S.

### VENTILATION

ROGERS, H. W. Investigation of comfort conditions in newsprint paper machine rooms. Pulp Paper Mag. Can. 55, no. 3: 224-8, 235 (Convention issue, 1954).

The author summarizes the methods of investigation used and the results obtained in a committee study of several typical newsprint machine rooms, solely with regard to operator comfort ventilation. Suggested methods for improving conditions are listed. In most machine rooms there are locations where the operator must frequently work and where the wet-bulb temperature exceeds 90°F.; these are the spots where some type of comfort cooling should be arranged. Specific locations can be treated much more economically than an entire large area. The figures given are approximate and are not intended

as a rigid requirement but rather as a general guide. 1 table, 7 figures, and 7 references. E.S.

### VOCABULARY, TECHNICAL

MICOUD, H. The physical properties of paper. Rev. papiers et cartons 16, no. 24: 23-7 (Dec. 15, 1953). [In French]

An excerpt from the author's two-volume treatise is given, in which certain frequently used papermaking terms are defined (leaf, page, ream, quire, folio ream, reels, and rolls of different sizes, etc.). 5 figures. E.S.

### WASTE

GUT, H. Are offcuts lost raw material? Allgem. Papier-Rundschau no. 1: 20-2 (Jan. 7, 1954). [In German]

The author discusses the possible profitable re-use of offcuts of paper and board in a converting plant, their storage, and recording. 3 tables. E.S.

### WASTE PAPER

ANON. An Austrian method for waste-paper regeneration. Allgem. Papier-Rundschau no. 4: 139 (Feb. 20, 1954). [In German]

A brief reference is made to a novel method of reclaiming waste paper developed by Georg Eineder (patents for the process and machinery have been applied for), in which the waste is fed to an autoclave from which the air is first evacuated, whereupon the liquid medium is gradually admitted. After soaking for 15-20 minutes uniform swelling has taken place, and a special disintegrator at a temperature of 20-30°C. and a consistency of 2.5-3% defelts and separates the individual fibers in the preswollen material without shortening or cutting. Stock losses do not exceed 10%, and kaolin is recovered. E.S.

BAKER, JACOB. What waste paper requirements will be in 1954, and why. Paper Trade J. 138, no. 13: 32, 34 (March 26, 1954).

Waste-paper requirements in 1954 are expected to total about 8 million tons; this amount is similar to the levels of 1950 and 1952, and less than 1951 and 1953. In most waste-paper grades supply will be well above demand. The decline in consumption of waste paper is attributed to the continuing improvement of grades of paper and board and the decline in production of the varieties of paper and board which use waste paper. New uses are being sought to absorb the excess waste paper. R.A.S.

NATIONAL ASSOCIATION OF WASTE MATERIALS DEALERS. *Waste Paper Institute.* Revised waste paper specifications. Paper Trade J. 138, no. 11: 21, 23-4 (March 12, 1954).

Revisions in the waste-paper specifications as contained in Circular WP-54 are presented. R.A.S.

### WATER-MARKS

ANON. Position and application of watermarks. Allgem. Papier-Rundschau no. 1: 12-13 (Jan. 7, 1954). [In German]

In letterheads and similar papers watermarks produce the most pleasing effects when they appear regularly in the same location on the sheet. The paper merchant and printer should always be informed in what size the final

product will be cut so that sheets will be delivered and printed in which the watermark will always appear in the correct upright legible position and not at a right angle or upside down; this frequently requires the availability of more than one size of sheets with identical watermarks. To avoid this expensive duplication of sizes, scattered watermarks (sometimes arranged diagonally to the machine direction), designs which are legible in four directions, or individual designs combined in a netlike arrangement may be used. The success of a paper will depend on the correct application of the watermark for the particular use requirement of the product. E.S.

WEISS, WISSO. The Fortuna watermark. Wochbl. Papierfabrik. 81, no. 23: 901-6 (Dec. 15, 1953). [In German]

An account of the Fortuna (goddess of fortune) watermark, the earliest forms of which appeared in the 16th century, is presented; its distribution notably in Holland and Germany is discussed. 5 figures and 13 references. E.S.

## WAXES

ANON. Protective waxes in industry. Allgem. Papier-Rundschau no. 3: 94, 96-7 (Feb. 5, 1954). [In German]

Following a brief review of the industrially important vegetable and mineral waxes, applications in the metal industry, paper conversion and packaging industry, and for the protection of buildings and wood impregnation are outlined. E.S.

## WET STRENGTH

LARSSON, KARL-GEORG, and THURNE, GÖSTA. Wet-strength paper and its production by beater-addition of a copolymer of butadiene and acrylonitrile. Svensk Papperstidn. 57, no. 3: 73-7 (Feb. 15, 1954). [In English; German and Swedish summaries]

A method for producing wet-strength papers from waterleaf paper treated with a negatively charged emulsion of butadiene-acrylonitrile copolymer is described. The resulting products are of a quality similar to those obtained with synthetic resins (urea or melamine). The best method of application consisted in coagulating the latex emulsion in a dilute pulp suspension with alum. However, the improved strength properties (measured by tensile strength and fatigue index [logarithm of the folding number]) became apparent only when the impregnated paper was subjected to a heat-conditioning treatment at high temperatures for a brief period so that the rubber spread throughout the paper. A temperature of 200°C. and periods between 8-16 minutes gave the best results. At higher temperatures (250°) rapid decomposition of paper and rubber took place, and below 175°, the curing took too long a time. When the curing period was extended to more than 30 minutes at 200°, both strength number and fatigue index decreased rapidly; after a treatment of one hour, the paper was practically destroyed. The author stresses that heat treatment of paper in itself increases wet strength, a fact which has generally not been noticed, because the improved strength properties obtained with synthetic resins have been entirely credited to these compounds. Reference is made to U. S. patent 2,116,544 granted to M. O. Schur on May 10, 1938, in which heat curing of waterleaf paper at elevated temperatures for brief periods with or without treatment with glue or similar substances (latex not included) for enhancing wet-strength properties is claimed. 4 diagrams and 32 references. E.S.

MYSLIŃSKA, ZOFIA, and PALENIK, KAROL. Use of melamine-formaldehyde resins in the manufacture of wet-strength paper.

Przeglad Papierniczy 9, no. 10: 319-20 (October, 1953). [In Polish]

For abstract *cf.* C.A. 48, no. 5: 3027 (March 10, 1954). 1 table. E.S.

### WOOD—CHEMISTRY

ENKVIST, TERJE, ALFREDSSON, BO, MERIKALLIO, MAUNU, PÄÄKKÖNEN, PAAVO, and JÄRVELÄ, OIVA. Formation of methyl-*cyclo*pentenolone by digestion of spruce wood or galactose with sodium hydroxide solutions at 100°C. Acta Chem. Scand. 8, no. 1: 51-9 (1954). [In English]

The formation of very small amounts of crystalline methylcyclopentenolone (I) from both the wood and from galactose was shown by comparing the absorption spectra, mixed melting points, and by forming dinitrophenyl hydrazones (m.p. 238°C.) of the various preparations. (I) was identical with that previously isolated from the soluble wood tar (*cf.* Goos and Reiter, B.I.P.C. 16: 319). (I) is not present in the original wood, but is apparently formed from the galactan, and possibly also from certain other polyoses on alkaline digestion; it is not formed from the lignin. The mechanism of (I) formation is discussed. Possibly a hexose gives rise to (I), a reductone (HO·CH:C[OH]·CHO), and water during the digestion. 2 tables, 4 figures, and 24 references. L.E.W.

### WOOD—EXTRACTIVES

AUSTIN, GEORGE T. Arabogalactan from western larch wood. J. Forest Products Research Soc. 4, no. 1: 7-10 (February, 1954).

Arabogalactan is a natural polysaccharide potentially available in large quantity at a low price, but a simple inexpensive process for its preparation has not been previously worked out. An easy commercial procedure involving hot water extraction, vacuum concentration, and spray drying has been carried through the pilot-plant stage. Rate curves have been worked out for bed-in-place extraction of coarse chips with hot water and alcohol solutions. Data on the properties of the stable product are presented. It has been shown that insulating board can be made from the extracted chips. With this process at hand, commercial development awaits a large-scale use for the material. 1 table, 10 figures, and 8 references. E.S.

SWIDINSKY, JOHN, MCMILLAN, FREEMAN H., and KING, JOHN A. The preparation of some nitrogenous derivatives of conidendrin. J. Am. Chem. Soc. 76, no. 4: 1148-51 (Feb. 20, 1954).

Ten amides have been prepared by the reaction of methylated *l*-conidendrin (obtained from the spent sulfite liquor of western hemlock pulping) with a variety of amines, and three of these amides have been reduced to the corresponding amino derivatives of conidendrin by lithium aluminum hydride. It has been observed that the lactone linkage in the dehydrogenated methylated conidendrin is very stable and nonreactive. 1 table and 32 footnotes. E.S.

### WOOD—PLASTICIZATION

RUNKEL, ROLAND O. H., and WITT, HERBERT. Contribution to the thermoplastic behavior of wood. III. The water- and alcohol-soluble portions of wood plasticized by heat; results of a paper-chromatographic study. Holz Roh- u. Werkstoff 11, no. 12: 457-61 (December, 1953). [In German] *cf.* B.I.P.C. 22: 56-7.

Chemical analyses and the physical and mechanical tests employed are

described. Wood was so heated that either gradual delignification ensued or that prehydrolysis gradually removed the hemicellulose. The products were then subjected to the authors' heat treatment. A heat-plasticized product from beechwood holocellulose (retaining 3.7% lignin) showed marked flexural strength, apparently resulting from the high adhesive properties of the hemicelluloses. On the other hand, this same product was not water repellent and showed a tendency toward swelling, indicating that the hemicelluloses certainly do not enhance the hydrophobic properties of the product. When the wood was prehydrolyzed so that most of the hemicelluloses were removed, the flexural strength of the product decreased sharply, whereas hydrophobic properties caused by lignin increased. Between these extremes were products resulting from partial delignification or from a mild prehydrolysis of the wood. In the hardwoods especially (gaged by the behavior of beech) there seems to be a good balance between the properties of plasticized material derived from lignin and those induced by the hemicelluloses. Hot water and alcoholic extracts of the plasticized products showed the presence of glucose, xylose, and phenolic bodies (determined simply by paper chromatograms), and also the possible presence of uronic acids. The relationships between these components changed with a change in the temperature of plasticization; these differences are discussed. 1 table, 6 figures, and 9 references. L.E.W.

### WOOD—SACCHARIFICATION

G. C. I. Cheaper sugar from wood. Ind. Eng. Chem. 46, no. 3: 13A, 15A (March, 1954); *cf.* B.I.P.C. 24: 579-80.

A similar description of the Rheinau process for improved wood saccharification as in the previous reference is given. 1 flowsheet. E.S.

### WOOD—WEIGHT

OLSON, HAROLD S. The purchase of wood by weight. J. Forest Products Research Soc. 4, no. 1: 34-6 (February, 1954).

The advantages of a method of purchasing wood on the basis of weight rather than volume are pointed out. Tests with a large number of truckloads of rough aspen showed a weight range per cord from 3900 to 5100 pounds. Seasonal variations tend to balance out over the year, since the price is set on a green-wood, winter-wood basis. R.A.S.

### WOOD TRANSPORTATION

ANON. Logging is a seagoing business. Pulp & Paper 28, no. 3: 78-80, 82, 84 (March, 1954).

Descriptions are presented of island pulpwood logging off the coast of Maine by the St. Regis Paper Co. and of loading pulpwood on scows on Lake Superior in the Fort William-Port Arthur area of Ontario. The island logs are transferred to the mainland by log drives or by barge. The use of marine jack ladders for loading the barges and the scows is particularly discussed. 8 illustrations. R.A.S.

### WOOD WASTE

LOCKE, EDWARD G., and JOHNSON, KENNETH G. Wood resources [East North Central States] Ind. Eng. Chem. 46, no. 3: 478-83 (March, 1954).

The pulp and paper industry in the East North Central States has an annual value of more than $1.5 billion. This can be multiplied many times by integrating wood-processing plants and chemical industries with the raw materials available. There are indications that the chemical industry will turn

to wood as an important raw material for a diversified industry. For the most part the chemical utilization of wood should be considered a scavenger operation which uses raw material of no value for structural purposes. There is a very large supply of such material in the area under consideration. The most promising source of low-cost wood for chemical purposes is primary manufacturing waste, because it is a by-product, it is concentrated, and the cost of transporting it from the woods is paid. A similar amount of logging waste is available but at much higher cost because of collection and transportation. To keep raw-material prices down, chemical uses must be correlated with the manufacture of wood into lumber, veneer, and similar products, so that these principal products can carry the major share of the cost of growing and harvesting logs. Estimates of the amount of material available for chemical utilization are given, and a number of proposed processes (pulping by different methods, defiberizing, distillation, extraction, carbonization, and hydrolysis) are discussed. 1 table, 4 figures, and 24 references. E.S.

MYKLAND, ERLING. The use of small-dimensioned and waste wood. Norsk Skogind. 8, no. 2: 69-70 (February, 1954). [In Norwegian; English summary]

The possibilities and problems connected with the utilization of small-dimensioned wood and sawmill waste in the pulp and paper industry, with particular reference to Norwegian conditions, are discussed. The economic importance of a rational utilization is stressed. E.S.

## X-RAY RESEARCH

DULMAGE, W. J. Unit cell and preliminary structure for cellulose triacetate. Nature 172, no. 4388: 1053 (Dec. 5, 1953).

On the basis of x-ray data from highly crystalline films of cellulose triacetate, an orthogonal unit cell is proposed containing four cellobiose hexaacetate residues. The dimensions are $a = 24.50$ A., $b = 11.56$ A., and $c = 10.43$ A. 2 figures and 2 references. K.W.,Jr.

SEGAL, LEON, LOEB, LEOPOLD, and CREELY, JOSEPH J. An x-ray study of the decomposition product of the ethylamine-cellulose complex. J. Polymer Sci. 13, no. 69: 193-206 (March, 1954). [French and German summaries]

The authors report the results of a study of the decomposition product of the ethylamine-cellulose complex obtained from cotton cellulose. The cotton remaining after removal of ethylamine by distillation possesses a crystalline component identical with the ammonia-cellulose decomposition product designated by other workers as cellulose III. Certain important differences between ramie cellulose III and cotton cellulose III are discussed, especially in regard to the relative ease of reconversion to cellulose I. Experimental data are given showing the effect on degree of conversion of temperature, and of two different times of immersion in boiling water. Data are also given showing the effect on the structure of the decomposition product of time of immersion in ethylamine. An attempt is made to explain the appearance of a strong diatropic 020 interference in the x-ray patterns of the decomposition product and of the regenerated cotton cellulose I. 2 tables, 7 figures, and 7 references. E.S.

## YELLOWING OF PAPER

ERIKSON, G. L. Yellowing of paper by printing inks. Inter-Society Color Council News Letter no. 109: 3-4 (November, 1953); no. 110: 8 (January, 1954).

Reference is made to a serious problem of color change of paper under the influence of printing inks and change of over-all color, particularly with greens, purples, and blues. The change is not so apparent with yellows, oranges, and reds. Examples of sample books printed about 20 years ago and in 1953 with the same ink on the same grade of paper substantiate the findings. The grade of paper used was found to be one of the best for holding color; others show even greater color changes. The author's remarks serve to illustrate that prints on paper are not a good way of preserving color samples; the method of putting these colors in opaque form on plastics seems to be much better. In the second part of the reference, comments by R. B. Hobbs of the National Bureau of Standards and H. S. Busby are given. E.S.

# Patent Section

*Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the* Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

*The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.*

*Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. Printed copies of Canadian patents are available at 50 cents per copy. Beginning with volume 21, the Canadian patents are abstracted from the complete specifications.*

## ADHESIVES

GRAY, HUGH W., and THEOBALD, CLEMENT W. Treatment of beta-methylene-beta-propiolactone copolymers. U. S. patent 2,653,146. Filed Dec. 7, 1950. Issued Sept. 22, 1953. 7 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 260-85.5]

The copolymers of β-methylene-β-propiolactone and an ethylenically unsaturated compound (e.g., ethylene, methyl vinyl ketone, methacrylic acid, etc.) reacted in the presence of a catalyst and an organic solvent form compounds useful in the preparation of films and as paper adhesives. W.B.W.

KREYLING, ROBERT L. Laminating adhesive and manufacture of combined fiberboard therewith. U. S. patent 2,669,282. Filed June 21, 1950. Issued Feb. 16, 1954. 19 claims. Assigned to Philadelphia Quartz Company. [Cl. 154-33.05]

An adhesive, particularly adapted for the production of laminated paperboard, comprises a mixture of about 65% sodium silicate, a raw finely divided unswollen starch, and a finely divided siliceous material with an average particle size not exceeding 2 μ. When applied at temperatures in the order of 70-80°C., the adhesive sets so rapidly that it presents no limitation upon machine speeds and is not subject to the dusting usually found in silicate adhesives. W.B.W.

## ALKALINE PROCESSES

HOLTZCLAW, JOHN B., and BROOKS, JOHN D. Recovery of useful product from spent doctor. U. S. patent 2,655,482. Filed July 23, 1952. Issued Oct. 13, 1953. 2 claims. Assigned to Standard Oil Development Company. [Cl. 252-183]

A spent sodium plumbite doctor solution resulting from treatment of hydrocarbon fractions contains sodium thiosulfate, sodium bisulfide, and water. Excess hydrogen sulfide is neutralized by the addition of caustic and the solution concentrated to a high sodium sulfide content suitable for utilization in the manufacture of paper pulp. 1 figure. W.B.W.

### ALUMINUM

SWAINE, WILLIAM G. Method of making metal foil pans. U. S. patent 2,669,914. Filed June 12, 1950. Issued Feb. 23, 1954. 3 claims. Assigned to Aluminum Foil Packaging Co. [Cl. 93-51]

Metal-foil pans for bakery goods are pressed between matched dies which produce a rounded corner with tucks at each side to provide a strong construction. 11 figures. W.B.W.

### BARKERS AND BARKING

BOUCHARD, OREZUL. Log-barking machine having a gimbal mounting for toothed log-feeding wheels. U. S. patent 2,669,266. Filed June 7, 1951. Issued Feb. 16, 1954. 4 claims. [Cl. 144-208]

This is identical with Canadian patent 495,823 (Sept. 8, 1953); *cf.* B.I.P.C. 24: 236. 8 figures. W.B.W.

### BEATER ADDITIVES

LINDQUIST, JOHN R. Paper making processes. U. S. patent 2,668,111. Filed March 5, 1952. Issued Feb. 2, 1954. 8 claims. Assigned to Certain-Teed Products Corporation. [Cl. 92-21]

Latices, resins, and the like which are added to the paper furnish in the form of emulsions are coagulated on the fiber by the addition of about 0.5% of guanidine formaldehyde. The corrosive effects of the low pH usually employed to coagulate the emulsion on the fiber by addition of alum or similar material is avoided as well as the build-up of undesirable solids in the white water system. W.B.W.

### BLEACHING—SULFATE

FENNELL, FRANCIS L. Bleaching chemical paper pulp. U. S. patent 2,668,095. Filed Sept. 22, 1950. Issued Feb. 2, 1954. 9 claims. Assigned to E. I. du Pont de Nemours and Company. [Cl. 8-106]

In the multistage bleaching of hardwood or softwood kraft pulps (soda, sulfite, or semichemical pulps may also be used) where a hypochlorite bleaching agent is followed by alkaline peroxide, the brightness of the final product is improved if the pulp is subjected to acidifying conditions for a short time, 5-15 minutes generally being sufficient. A pH of less than 6 is essential and is best achieved by chlorine or hydrochloric acid, although any acid-reacting material may be employed. For best results, the pulp is washed between each stage. W.B.W.

### BOARD

MACDONALD, MORTIMER D. Method of making composite, consolidated products and apparatus therefor. U. S. patent 2,658,847. Filed July 26, 1949. Issued Nov. 10, 1953. 16 claims. Assigned to State of Oregon, acting by and through the Oregon State Board of Forestry. [Cl. 154-101]

Wood fiber, shavings, and other wood-waste materials are passed through a zone of extreme turbulence to reduce particle size, then descend through a mist of binder material (asphalt, bitumens, thermosetting resins, etc.) which is sprayed upward into the chamber. This countercurrent flow of binder and fiber particles insures complete coating of the particles and is claimed to reduce the quantity of binder required. The binder-coated particles may be formed into board or other molded articles. 5 figures. W.B.W.

OTHMER, DONALD F., and SMITH, WARREN R. Method of preparing molded products of lignocellulose and lignin. U. S. patent 2,669,522. Filed Dec. 16, 1950. Issued Feb. 16, 1954. 2 claims. [Cl. 106-123]

Lignocellulosic materials (comminuted wood waste or agricultural products such as bagasse or coconut fibers) are formed into boards possessing high structural strength by the addition of a commercial lignin (Indulin A or C, Meadol, Benaloid, etc.) to increase the total lignin percentage to between 33 and 40% (dry basis). The boards are formed by a dry process, and the material is consolidated by heating between 220 and 275°C. at pressures varying from 300 to 750 p.s.i. W.B.W.

## BOARD, ASBESTOS

SMITH, CHARLES C. Method of making asbestos-cement sheets. U. S. patent 2,669,166. Filed Aug. 16, 1949. Issued Feb. 16, 1954. 1 claim. Assigned to The Ruberoid Co. [Cl. 92-40]

A modification of a Hatschek machine makes the use of the accumulator roll unnecessary and supplies a continuous web formed from asbestos fiber and cement of the desired thickness which may be slit to form the upper and lower faces. Additional thickness of the laminate may be obtained by feeding dry cement and asbestos fiber from a hopper onto the lower web whose moisture supplies water for hydration of the cement, or additional water may be sprayed onto the cement. The two webs are united, and cement grout and granules may be applied to the face of the composite board before passing through the press roll and cutting to board size. 5 figures. W.B.W.

## BOARD, BUILDING

HUMBLE, CHARLES F. Composition shake panel. Canadian patent 500,218. Filed Jan. 31, 1950. Issued Feb. 23, 1954. 5 claims. Assigned to Western Insulated Products, Inc.

Fiber insulating board about 0.5 inch thick and in panels four feet wide by 15 inches high is rabbitted on opposite edges so that, when these panels are mounted on exterior walls, they give the appearance of lapped shakes. Two coatings of hot asphalt are applied to make a weatherproof surface, and granules are pressed into the asphalt; embossing rolls are used to form grooves in the finished board to simulate the appearance of wooden shakes. 7 figures. W.B.W.

## BOARD, FIREPROOF

PANIK, IRENE M., and SULLIVAN, WILLIAM F. Method for rendering cellulosic materials fire resistant. U. S. patent 2,668,780. Filed Nov. 27, 1951. Issued Feb. 9, 1954. 4 claims. Assigned to National Lead Company. [Cl. 117-62]

This is a continuation in part of U. S. patent 2,658,000 (Nov. 3, 1953; *cf.* B.I.P.C. 24: 409-10), except that the partial drying step may be carried out at temperatures up to 60°C. W.B.W.

ROBISON, JOHN E. Fire retardant coating containing a carbohydrate, urea or melamine-formaldehyde and dicyandiamide or melamine. U. S. patent 2,648,641. Filed Aug. 3, 1950. Issued Aug. 11, 1953. 9 claims. Assigned to Fir-Tex Insulating Board Co. [Cl. 260-17.3]

An intumescent fire-retarding composition for wallboard or fabrics which will withstand washing is composed of an aminoplast-aldehyde, an amido (e.g., melamine or dicyandiamide) compound, and a carbohydrate such as one of the sugars, gums, etc.; the materials are combined in the approximate ratios of 1:2:1. The above mixture may be applied in either a solvent or aqueous system and cured by heat or a catalyst, depending upon conditions. W. B. W.

## BOARD, LAMINATED

ALLAN, JOHN, and THOMAS, EDWARD B. Process for the production of fibrous webs. U. S. patent 2,670,316. Filed July 18, 1950. Issued Feb. 23, 1954. 2 claims. Assigned to British Celanese Limited. [Cl. 154-136]

A laminate with high impact strength and low water absorption is made by impregnating a fabric web (especially of regenerated cellulose) or paper with a water-soluble, thermosetting resin, then with a water-insoluble, alcohol-soluble, thermosetting resin. The impregnated sheets are heated at 65-70°C. for three hours, then stacked and pressed at 160° and 1000 p.s.i. for one hour. W.B.W.

## BOARD SPECIALTIES

ARNESON, EDWIN L. Bottle carrier. U. S. patent 2,668,653. Filed Feb. 12, 1949. Issued Feb. 9, 1954. 8 claims. Assigned to Morris Paper Mills. [Cl. 229-28]

A collapsible paperboard bottle carrier features a central upstanding panel with apertures to receive a wire handle member; partitions formed by cutting and folding the top of the corners inwardly are held in locked position by the clamping action of the handle ends. 6 figures. R.A.S.

BUCHMILLER, EARL P., and COHEN, HAROLD. Paperboard serving tray. U. S. patent 2,670,124. Filed Jan. 16, 1952. Issued Feb. 23, 1954. 4 claims. [Cl. 229-27]

A disposable foldable rectangular paperboard tray for serving foods and drinks is stored and shipped in flat-sheet form and easily erected manually without special assembly operations. Recesses in the double-end construction provide supports for beverage cups. 10 figures. W.B.W.

DAVIDSON, GEORGE W., KUPFER, ALLEN M., and KILMER, CHARLES B. Corner pad. U. S. patent 2,670,122. Filed March 22, 1952. Issued Feb. 23, 1954. 2 claims. Assigned to Container Corporation of America. [Cl. 229-14]

Corner pads for the protection of articles packed in shipping containers are made by folding a rectangular strip of corrugated paperboard into eight sections, forming a triple thickness for each side of the object, and scoring and doubling the two remaining sections over the top. 5 figures. R.A.S.

OLSON, DOUGLAS J. Plate provided with depending gripping means. U. S. patent 2,669,379. Filed Aug. 3, 1950. Issued Feb. 16, 1954. 2 claims. [Cl. 229-1.5]

Fracture lines in the rim of a paper plate make it possible to bend down two almost semicircular portions of the rim for gripping between the knees of the user. R.A.S.

## CELLULOSE ESTERS

SALATHIEL, RICHARD A. Drilling muds. Canadian patent 499,931. Filed Nov. 3, 1949. Issued Feb. 9, 1954. 8 claims. Assigned to Standard Oil Development Company.

Filtration loss from drilling muds is reduced by the addition of dispersible alkali metal salts of the sulfate esters of cellulose in amounts varying from 0.1 to 3% of the cellulose ester on the weight of solids in the mud. Gel strength and viscosity are not adversely affected by the addition of these salts. 11 figures. W.B.W.

## CHLORINE DIOXIDE

WAYMAN, MORRIS, and RAPSON, WILLIAM H. Method and apparatus for producing chlorine dioxide. Canadian patent 499,846. Filed Aug. 8, 1949. Issued Feb. 9, 1954. 5 claims. Assigned to Canadian International Paper Company.

An apparatus and process are adapted for the continuous production of chlorine dioxide by reaction between sulfur dioxide and a metallic chlorate solution. This is identical with U. S. patent 2,598,087 (May 27, 1952); *cf.* B.I.P.C. *22*: 870. 5 figures. W.B.W.

## COOKING PROCESS

BATE, STANLEY C., PEACH, FRANCIS G., and ROGERSON, WALTER A. Production of cellulose. U. S. patent 2,668,761. Filed April 27, 1950. Issued Feb. 9, 1954. 11 claims. Assigned to British Celanese Limited. [Cl. 92-9]

Cellulose is produced from wood chips, straw, or other lignocellulosic material by boiling at 120-150°C. in a mixture of chloracetic and glacial acetic acid with a diluent such as xylene or nitrobenzene for 1.5-4 hours. The pulping agent is filtered from the cellulose, treated with alcohol or water to precipitate the lignin, then concentrated, preferably by solvent extraction with mixtures of ethyl acetate and benzene. An increase in yields of from 13 to 20% over conventional pulping methods with an improved quality of cellulose is claimed for the process. W.B.W.

## CORK

BILLMEYER, BRUCE R. Method of making cork composition. Canadian patent 499,987. Filed Feb. 4, 1948. Issued Feb. 16, 1954. 6 claims. Assigned to Armstrong Cork Company.

Particles of ground cork are mixed with natural or synthetic rubber latex and a vulcanizing agent; the water content of the mixture is reduced to about 6-10% by weight, and the resulting mass charged to a mold and molded at a temperature of 230-315°F. into gaskets, midsoles, and the like. W.B.W.

WILEY, JOHN W. Cork compositions and method of making the same. Canadian patent 499,988. Filed Feb. 4, 1948. Issued Feb. 16, 1954. 6 claims. Assigned to Armstrong Cork Company.

Cork compositions which are flexible and possess a high degree of air permeability are made by molding a mixture of cork particles with a synthetic rubber latex and a vulcanizing agent at 220-275°F. at pressures varying from 25 to 400 p.s.i., depending on the nature of the product desired. W.B.W.

## COTTON STALKS

SPENCER, ARTHUR M., JACOBSON, ABNER, and SIXT, KARL. Method for fiber liberation in cotton stalks and the pulp. U. S. patent 2,668,110. Filed June 18, 1948. Issued Feb. 2, 1954. 4 claims. Sixt's interest assigned to Spencer and Jacobson. [Cl. 92-6]

A method of liberating fiber from cottonstalks is claimed in which the chopped stalk is digested with a wetting agent (Tergitol, Taxad, or sodium lauryl sulfonate are preferred) and dilute alkali for 5-15 minutes at 250-350°F., whereupon the fibers are separated by nonabrasive beating. The digester illustrated embodies a series of shelves, each shelf divided by baffles to force the aqueous suspension of the fibers to follow a tortuous path while subjected to increasing temperatures from the heated shelves. At the conclusion of the above defibering, an asphaltic emulsion or the like may be added to the suspension and deposited on the fiber by suitable pH adjustment; the stock is formed on a Fourdrinier machine into wallboard, roofing paper, insulation, etc. with or without lamination. 4 figures. W.B.W.

## DYES AND DYEING

CHIEN, LUTHER C. Castor oil soluble coloring composition for coating copying paper. U. S. patent 2,668,172. Filed July 16, 1952. Issued Feb. 2, 1954. 4 claims. Assigned to E. I. du Pont de Nemours and Company. [Cl. 260-388]

The castor oil-soluble dye, Victoria pure blue BOC used as the coloring material in duplicating papers, is stabilized and prevented from crystallizing out of the hot castor oil coating solution by the addition of the sodium salt of dibutyl-*o*-phenyl-phenoldisulfonic acid. This compound is described more fully in U. S. patent 2,135,978 (Nov. 8, 1938) granted to George L. Magoun. In the examples given, 4-5% of the compound based on the weight of dye is added to the coating composition. W.B.W.

GOLD, HEINRICH, and PETERSEN, SIEGFRIED. Whitening agents for organic materials. U. S. patent 2,668,777. Filed Oct. 5, 1949. Issued Feb. 9, 1954. 8 claims. Assigned to Farbenfabriken Bayer Aktiengesellschaft. [Cl. 117-33.5]

The use of fluorescent optical brightening agents derived from benzidine or diaminostilbene disulfonic acid (which compounds contain several 1,2,3-triazole rings/molecule) is claimed. These substantive materials may be applied to finished paper or to the pulp during processing. W.B.W.

KENDALL, JOHN D., and DUFFIN, GEORGE F. Process for improving the whiteness or colour of materials. Canadian patent 499,887. Filed May 29, 1950. Issued Feb. 9, 1954. 13 claims. Assigned to Ilford Limited.

Fluorescent compounds which are useful as optical brightening agents for synthetic or natural fibers (including wood pulp) contain a pyrazoline nucleus (especially phenyl or sulfophenyl groups) and may be used in either the water-soluble or water-insoluble form. W.B.W.

## ERADICATORS

STEINHARDT, DAVID W. Method of restoring used color-reactant record material for reuse. U. S. patent 2,669,503. Filed June 23,

1951. Issued Feb. 16, 1954. 9 claims. Assigned to The National Cash Register Company. [Cl. 8-102]

An eradicator fluid (glacial acetic acid in acetone in one example) for use with manifold record materials of the type claimed in U. S. patent 2,548,364 (April 10, 1951; *cf.* B.I.P.C. 21: 673) restores the color-reactant surface to its original condition. The eradicator is effective only after the immediate color change and is not effective after the oxidation reaction has taken place.
W.B.W.

## FOLDING BOXES

FRANKENSTEIN, WILLIAM P. Carton. U. S. patent 2,670,123. Filed July 28, 1949. Issued Feb. 23, 1954. 10 claims. [Cl. 229-27]

Transversely partitioned cartons which can be shipped and stored in knock-down form are cut from a single blank of cardboard, etc. The four side walls are provided with extensions which are folded and then sealed to the bottom with adhesive. The double hollow walls formed contain notches to secure the partitions which are cut and folded up from the bottom. 21 figures.
R.A.S.

FRANKENSTEIN, WILLIAM P. Carton. U. S. patent 2,670,125. Filed March 19, 1948. Issued Feb. 23, 1954. 15 claims. [Cl. 229-31]

A carton cut from a single blank of cardboard, paperboard, and the like is provided with extensions which can be folded in such a manner that the bottom and all four side walls are double and hollow; the free ends are secured with adhesive. Numerous variations are described. 24 figures.
R.A.S.

FRANKENSTEIN, WILLIAM P. Carton. U. S. patent 2,670,126. Filed Feb. 24, 1949. Issued Feb. 23, 1954. 14 claims. [Cl. 229-31]

Two extensions of this knock-down carton cut from a single sheet of cardboard, paperboard, etc. fold inwardly and are braced by means of a glued flap to provide an inclined surface for a better display of contents; the end extensions form double hollow walls and hold the inclined extensions in position. 26 figures. R.A.S.

FREEL, WILLIAM G., and JONES, SAMUEL F. Carton. U. S. patent 2,668,654. Filed Dec. 11, 1947. Issued Feb. 9, 1954. 3 claims. Assigned to William P. Frankenstein. [Cl. 229-31]

A carton with double walls and an air space between is cut from a single blank of cardboard or similar material and provided with a double cover integral with the construction. A cardboard strip may be inserted to retain the cover in open position. 9 figures. R.A.S.

GRENIER, JOSEPH A. R. Egg carton. U. S. patent 2,669,380. Filed June 23, 1952. Issued Feb. 16, 1954. 2 claims. [Cl. 229-7]

A partitioned egg carton incorporates a bottom liner with die-cut flaps which coincide with the finger hole in the bottom of each compartment for easy removal of the egg from each cell. 5 figures. R.A.S.

STOWITTS, FRANK H. Carton. U. S. patent 2,670,128. Filed Aug. 15, 1947. Issued Feb. 23, 1954. 3 claims. Assigned to Michigan Carton Company. [Cl. 229-38]

A siftproof container is claimed in which the opposite flaps are of such size that they form a tight seal at the corners; the edge of the inner flap is folded back upon itself, while the outer flap is sealed to the front wall of the container. 8 figures. R.A.S.

## LIGNIN

MACGREGOR, DONALD W., and GRIFFITH, THOMAS R. Lignin-reinforced rubber. U. S. patent 2,669,592. Filed Aug. 24, 1951. Issued Feb. 16, 1954. 9 claims. Assigned to Howard Smith Paper Mills Limited. [Cl. 260-756]

Oxidized or unoxidized lignin derived from softwoods or hardwoods by either the kraft or soda process is incorporated into natural rubber, together with an oxide of copper, zinc, or lead, to produce a vulcanizate of high tensile strength and a Bashore resilience as high as 65%. W.B.W.

## MACHINERY—CONVERTING MACHINERY

BACK, LEONARD. Transfer mechanism for sealing means. U. S. patent 2,668,708. Filed April 28, 1950. Issued Feb. 9, 1954. 15 claims. Assigned to The Interstate Folding Box Company. [Cl. 271-49]

Extremely flexible heat-sealable materials such as cellophane are formed into a flattened bag tube about a forming plate and heat sealed before severing the tube into bag lengths. Movement of the tubes through subsequent operations is effected by means of rubber belts under tension which frictionally engage the tubes and move them without causing wrinkling or cocking. 9 figures. W.B.W.

BEHL, JOHN D. Machine for erecting double side walls on double walled cartons. U. S. patent 2,669,167. Filed Dec. 3, 1952. Issued Feb. 16, 1954. 16 claims. Assigned to Sutherland Paper Company. [Cl. 93-49]

Side and end walls of double-walled cartons are formed from paperboard or cardboard folded and erected by a series of beveled rollers which act on the blank as it is conveyed through the machine. A glued flap holds opposite walls in place, and interlocking notches are forced into place behind notched shoulders by shoes which act in timed relationship with the conveyor chain. 16 figures. W.B.W.

BURGER, MARTIN. Egg carton set-up device. U. S. patent 2,668,482. Filed May 23, 1950. Issued Feb. 9, 1954. 18 claims. Assigned to General Package Corporation. [Cl. 93-37]

This manually operated device for setting up paperboard egg cartons embodies swingable leaves to engage the cross partitions and force these partitions into the locking tabs in the erected position. 14 figures. W.B.W.

BURGER, WILLIAM H., COLLINS, HOWARD A., and RUTH, HOWARD M. Method and apparatus for making tampons. Canadian patent 500,040. Filed Sept. 3, 1948. Issued Feb. 16, 1954. 32 claims. Assigned to International Cellucotton Products Company.

A web of wood or cotton cellulose is converted into tampon-body units which are successively enclosed in a knitted sleeve; the sleeve is severed

between units, then the forward end of each tampon unit is spread to receive the loose ends of the knitted material and pressed back into a smooth uniform shape, and the finished unit is ejected from the machine. 26 figures.
W.B.W.

CERONE, PASQUALE L. Ribbon curler. U. S. patent 2,669,913. Filed Nov. 1, 1949. Issued Feb. 23, 1954. 3 claims. [Cl. 93-1]

A motor-driven device imparts a uniform curl to several yards of paper ribbon per minute; the ribbon is to be used for ornamentation of packages wrapped in retail stores. 3 figures. W.B.W.

PETERSON, WILLIAM R., and PENROD, WILLIAM R. Apparatus for closing paper bags. U. S. patent 2,669,201. Filed Nov. 3, 1950. Issued Feb. 16, 1954. 10 claims. Assigned to St. Regis Paper Company. [Cl. 112-11]

Slack is removed from the upper portion of open-mouthed, filled bags to be sewed by cam-shaped elements which contact the bag surface lightly and intermittently to lift slack from the wall and, at the same time, horizontally mounted cylinders on either side of the stitching device lift and smooth the walls just ahead of the stitcher. 5 figures. W.B.W.

ROBINSON, PAUL C. Machine for manufacturing valve bags. U. S. patent 2,668,481. Filed Oct. 29, 1948. Issued Feb. 9, 1954. 4 claims. Assigned to Arkell and Smiths. [Cl. 93-8]

Bag tubes are conveyed into the machine with the valve end of the bag in the spread and flattened condition ready to receive the valve sleeve. A conveyor with suitable gripping devices carries the bag tube through the machine while adhesive is applied, the sleeve insert cut from a supply roll and brought into contact with the band of adhesive at the proper point, and the end of the tube refolded to the point where the bag is discharged from the machine ready for stitching. 17 figures. W.B.W.

UNGAR, GUSTAVE A. Apparatus for making honeycomb cores for sandwich-type structures. U. S. patent 2,670,026. Filed Feb. 1, 1952. Issued Feb. 23, 1954. 14 claims. Assigned to Douglas Aircraft Company, Inc. [Cl. 154-1.8]

An apparatus for producing an expanded honeycomb core structure from a web of kraft paper or fabric ready for incorporation between the side plates is claimed. The web is first impregnated with a material such as a phenolic resin, then dried at a temperature below that required for curing. A series of rolls next acts upon the impregnated web to score, slot, and apply adhesive on certain areas before it is fan-folded between opposed belts and heated to cure the resins. The completed core is then drawn out to its predetermined width. 20 figures. W.B.W.

UNGAR, GUSTAVE A. Method for making honeycomb cores for sandwich type structures. U. S. patent 2,670,314. Filed March 18, 1948. Issued Feb. 23, 1954. 18 claims. Assigned to Douglas Aircraft Company, Inc. [Cl. 154-117]

This is very similar to U. S. patent 2,670,026 (Feb. 23, 1954); *cf.* abstract above. 18 figures. W.B.W.

### MACHINERY—CORRUGATING MACHINE

LARSSON, OLOF E. Apparatus and process for corrugating paper. U. S. patent 2,668,573. Filed March 9, 1948. Issued Feb. 9, 1954. 6 claims. [Cl. 154-30]

A process for corrugating paper is claimed in which the sheet is first passed between smooth feed rolls, and then enters a channel formed by plates spaced apart the height of the finished corrugations. During the starting operation the channel is blocked, thereby forcing the paper to build up behind the obstruction and, as the obstacle is gradually removed, the friction of the paper against the upper and lower plates furnishes sufficient impedance to force the sheet into corrugations. The paper is fed into the rolls in a slightly moistened condition, and the restricting plates are heated to dry the ridges and set the corrugations. 6 figures. W.B.W.

SEGRE, JAMES. Apparatus for molding corrugated asbestos-cement sheets. U. S. patent 2,668,574. Filed Feb. 7, 1952. Issued Feb. 9, 1954. 4 claims. [Cl. 154-30]

Corrugated metal interleaving platens between which asbestos-cement sheets are formed in a press are of nonuniform thickness to make the pressed sheet of uniform thickness. The metal at the top and bottom of the corrugations is slightly thicker than the sloping sidewalls to avoid the thin sidewall formation characteristic of sheets pressed between platens of uniform thickness. 9 figures. W.B.W.

### MACHINERY—CREPING MACHINE

GRETTVE, KARL E. L. Apparatus and method for creping paper. U. S. patent 2,667,910. Filed Dec. 22, 1949. Issued Feb. 2, 1954. 6 claims. [Cl. 154-30]

A machine for creping paper or foil incorporates an endless elastic band which is of such thickness that during the passage of the band over a relatively small rotating cylinder, the outside of the band will become sufficiently tensioned that the creping operation will be accomplished as the paper web is brought to the tensioned portion of the band. The creped sheet and the band are separated at the point where the tension on the band is relaxed. This is the same as Canadian patent 467,307 (Aug. 15, 1950); *cf.* B.I.P.C. 21: 135. 3 figures. W.B.W.

### MACHINERY—CUTTERS

MCARN, THEODORE A. Automatic cutoff for paperboard machines. U. S. patent 2,667,821. Filed Feb. 18, 1950. Issued Feb. 2, 1954. 4 claims. Assigned to Downingtown Manufacturing Company. [Cl. 92-67]

The accumulator roll of a wet-board machine is provided with a slot into which a knife is forced by a double-acting air cylinder when the desired thickness of stock on the roll is reached. The rotation of the roll is not interfered with during the cutting, and the roll speed may be increased over that employed with manual cutting. Quality is claimed to be improved by the reduced thickness of each layer in the built-up board. 13 figures. W.B.W.

### MACHINERY—DRYERS

CRAM, HERVEY G. Syphon for dryers. Canadian patent 500,108. Filed Sept. 18, 1950. Issued Feb. 23, 1954. 10 claims.

A siphon leg embodies a slip ring for alignment between trunnion and the steam-joint body; a handle provides for radial alignment of the leg within the cylinder. This is the same as U. S. patent 2,617,205 (Nov. 11, 1952); *cf.* B.I.P.C. 23: 294. 7 figures. W.B.W.

MESSINGER, WILLIAM. Drier. U. S. patent 2,661,545. Filed Feb. 1, 1950. Issued Dec. 8, 1953. 10 claims. [Cl. 34-124]

A drier drum is made from sections bolted together and comprises an inner and outer shell. The inner shell is channeled to provide passage for the heating medium through the channels and adjacent the outer shell. A series of manifolds connect the channels with the steam supply and condensate lines which communicate with the drum through a hollow trunnion. 7 figures. W.B.W.

## MACHINERY—PACKAGING MACHINERY

BAREFOOT, JOCIE C. Stop motion apparatus for wrapping machines. U. S. patent 2,668,404. Filed June 1, 1949. Issued Feb. 9, 1954. 5 claims. [Cl. 53-29]

Sensing elements in a cake-wrapping machine establish the presence of both the cake and the sheet of wrapping material (e.g., cellophane) at the start of each wrapping cycle. Should either component be lacking, the control system is interrupted and the machine is stopped. 17 figures. W.B.W.

BENZ, JOHANNES. Apparatus for packaging plastic materials. U. S. patent 2,669,077. Filed Aug. 24, 1951. Issued Feb. 16, 1954. 8 claims. [Cl. 53-95]

Butter or other semisolid substances are packaged in this small machine intended for very limited production in which a reciprocating mold oscillates between a station where a prefolded wrapper is inserted and a second station where the product is placed in the wrapper-lined mold. The package is ejected, and the mold returns to the first station to repeat the cycle. 5 figures. W.B.W.

DROLL, JOSEPH W. Mattress winding and wrapping machine. U. S. patent 2,668,405. Filed Jan. 29, 1951. Issued Feb. 9, 1954. 12 claims. Assigned to Meridan Corporation. [Cl. 53-52]

Wrapping paper from a supply roll and a mattress to be wrapped are engaged by a mandrel which draws the mattress and paper into a spiral about the mandrel; the free end of the wrapping is secured by gummed tape. 23 figures. W.B.W.

HOAG, RODERICK W. Method and machine for filling and wrapping packages. U. S. patent 2,669,814. Filed Aug. 22, 1952. Issued Feb. 23, 1954. 5 claims. Assigned to Hoag-Russell Corporation. [Cl. 53-10]

Corrugated container elements on a wrapper web are fed into a duplex machine, the web is slit, folded over to seal one end of the corrugations, the packets are filled, and the other end is sealed; groups of packets are severed from the web. 7 figures. W.B.W.

IRMSCHER, HANS O. Carton contents tamping and sealing apparatus. U. S. patent 2,669,813. Filed Jan. 26, 1950. Issued Feb. 23,

1954. 15 claims. Assigned to National Tea Packing Company, Inc. [Cl. 53-6]

A reciprocating plunger tamps down the contents of a carton prior to the closing and sealing operations. This is identical with Canadian patent 484,360 (June 24, 1952); *cf.* B.I.P.C. 22: 963. 15 figures. W.B.W.

JACKSON, DONALD R. P. Wrapping or packing machine. U. S. patent 2,668,406. Filed Aug. 27, 1951. Issued Feb. 9, 1954. 1 claim. Assigned to Molins Machine Company, Limited. [Cl. 53-131]

A machine for block-ended wrapping of a cigarette package or the like is claimed in which the wrapping is folded over the end of the assembled articles so that half of it extends over the upper and half over the lower side of the pack; the sides are tucked in and the lap joints pressed down against the thin reciprocating metal plates between which the articles are held during packaging. 7 figures. W.B.W.

ORMSBY, JAMES W. Apparatus for packaging articles. U. S. patent 2,669,076. Filed Aug. 31, 1950. Issued Feb. 16, 1954. 10 claims. [Cl. 53-91]

Open-end, sleeve-type cartons with can-engaging flaps at either end are delivered in the flattened condition to the mechanism for erection and filling. 17 figures. W.B.W.

SCHMIDT, EDGAR H., and COSSABOON, KARL F. Machine for assembling sheet form material. Canadian patent 499,685. Filed June 15, 1950. Issued Feb. 2, 1954. 32 claims. Assigned to E. I. du Pont de Nemours & Company.

A device for assembling predetermined lengths of sheets of photographic papers or films and interleaving with separator sheets is claimed. The device includes an inspection and sheet-reject apparatus to discard defective items before assembly into the final pack. The operation of the machine is entirely automatic and especially suited to handling of light-sensitive materials in partial or complete darkness. 61 figures. W.B.W.

## MACHINERY—PASTING MACHINE

GIGLER, WILFERD C. Machine for sealing cartons. U. S. patent 2,670,027. Filed Feb. 3, 1951. Issued Feb. 23, 1954. 3 claims. [Cl. 154-42]

Cartons with heat-sealable adhesive applied to bottom and top flaps during manufacture are sealed by this machine employing a heated pressure plate controlled by an air cylinder or other means to contact the top while the carton is resting on a heated anvil. Upon termination of the heating period, the carton is moved to a second station where a platen applies pressure during the setting period of the adhesive. 7 figures. W.B.W.

ZINN, JULIUS A., JR., and SHAW, CURTIS B. Method of and apparatus for closing and sealing containers. U. S. patent 2,669,815. Filed April 19, 1950. Issued Feb. 23, 1954. 23 claims. Shaw's interest assigned to Zinn. [Cl. 53-20]

A closing and sealing apparatus is claimed for liquid-holding containers with fully depressible bellows-type end closures. Heat lamps preheat the

closure rib sufficiently to melt the paraffin coating of the paperboard and to soften the hot-melt adhesive applied to selected areas of the closure flaps. Heated rolls finish the sealing operation as the container is moved through the machine by a conveyor. 27 figures. W.B.W.

### MACHINERY—PULPERS

BAXTER, JOSEPH, JR. Paper machinery. U. S. patent 2,669,165. Filed July 10, 1950. Issued Feb. 16, 1954. 10 claims. Assigned to The Black-Clawson Company. [Cl. 92-20]

This device for defibering papermaking stock comprises a pair of rapidly rotating brushes in touching contact; each brush consists of a relatively large core covered with short bristles. As the stock is fed between these brushes, the bristles tear the fiber bundles apart and release the individual fibers. Stock is discharged from the nip between the brushes onto a rapidly rotating wire-covered cylinder from which the fiber is thrown in one, and the water in the opposite direction, or the drum may be eliminated and the fiber and water recombined in a receiving vessel below the nip. 5 figures. W.B.W.

### MACHINERY—SHEET-FEEDING MECHANISM

ROBINSON, GRANT R. Sheet separating devices. Canadian patent 499,900. Filed Aug. 2, 1951. Issued Feb. 9, 1954. 5 claims. Assigned to Old Town Ribbon & Carbon Co., Inc., of Mass.

A sheet stop supported on pivot arms opposes the forward movement of the top sheet in the stack as the supporting carriage is moved forward. This causes the forward edge of the sheet to buckle, thus separating the sheet from the stack, whereupon the forward edge passes over the sheet stop and engages the nip of the feed rolls. 7 figures. W.B.W.

WINTERS, WILLIAM P. Sheet feeding and slitting machine with strip feeding device. U. S. patent 2,668,591. Filed May 24, 1951. Issued Feb. 9, 1954. 6 claims. Assigned to American Can Company. [Cl. 164-61]

Metal or fiber-container blanks are cut from material fed between slitting rollers; the blanks are deposited on a stepped platform, from which they are removed in timed sequence by feed dogs attached to a chain conveyor as the platform is lowered over the conveyor. Uniform feeding of blanks without skipping or double feeding is claimed. 11 figures. W.B.W.

### MACHINERY—SLITTERS AND WINDERS

CROSBY, EDWARD A. Apparatus for winding and unwinding flexible sheet material. Canadian patent 500,109. Filed March 9, 1950. Issued Feb. 23, 1954. 6 claims.

An arbor for engaging the hollow core of a paper roll is clamped to the winder shaft by fixed collars and engages the core by means of a rubber-covered cord fastened at the ends and urged outward of a tapered groove by a spring. As the cord approaches the shallow part of the groove, it tends to bind the core with increasing force. An adaptor arbor may be slipped over the fixed arbor to make feasible the use of larger cores. 4 figures. W.B.W.

HORNBOSTEL, LLOYD. Winder machine. Canadian patent 499,991. Filed Sept. 13, 1951. Issued Feb. 16, 1954. 9 claims. Assigned to Beloit Iron Works.

This is the same as U. S. patent 2,654,546 (Oct. 6, 1953); *cf.* B.I.P.C. 24: 507. 6 figures. W.B.W.

PRIEST, LESTER. Rewinding machine. U. S. patent 2,670,152. Filed March 3, 1950. Issued Feb. 23, 1954. 6 claims. Assigned to McLaurin-Jones Co. [Cl. 242-66]

A machine for slitting a wide web and rewinding it onto a number of cores for the production of small consumer rolls embodies a blade device attached to the head-roll bearing blocks to tuck the paper of the finished rolls between the mandrel and the bed rolls. This eliminates the manual tucking of a number of webs and assures a smooth uniform tension across the entire width of the newly started web. 7 figures. W.B.W.

WOLFE, HENRY J. Winding machine. U. S. patent 2,668,675. Filed Aug. 6, 1948. Issued Feb. 9, 1954. 6 claims. Assigned to National Gypsum Company. [Cl. 242-56]

A continuous web (e.g., joint tape used in wallboard construction) is converted into consumer-type rolls of predetermined length by the machine claimed. Rotatable mandrels mounted on a rotatable turret pass successively through core loading, roll starting, winding, and unloading stations; after the cut-off knife has severed the strip from the small roll, the free end of the web is fastened by a strip of gummed tape applied from a supply roll. 35 figures. W.B.W.

## MACHINERY—SUCTION ROLLS

GOODWILLIE, JOHN E., and HORNBOSTEL, LLOYD. Apparatus for removing liquids from perforated rotating shells. U. S. patent 2,669,912. Filed May 13, 1949. Issued Feb. 23, 1954. 5 claims. Assigned to Beloit Iron Works. [Cl. 92-53]

Water is removed from the perforations in slowly rotating suction rolls by the introduction of air under pressure into the inside of the shell and forcing the water to the outside of the roll. The necessary packing strips and the trough to catch the expelled water can be added to existing machinery. The efficiency of the roll is increased by preventing the reintroduction of water into the press felt. 2 figures. W.B.W.

## MACHINERY—THICKENERS

GIBSON, ALBERT G. Apparatus for thickening liquid slurry stocks. U. S. patent 2,669,909. Filed June 15, 1950. Issued Feb. 23, 1954. 8 claims. Assigned to The Black-Clawson Company. [Cl. 92-42]

The consistency of stock delivered from a cylinder-mold-type thickener is controlled by the amount of dilute stock allowed to pass the vat overflow to be mixed with thickened stock from the couch roll. A longitudinally fluted or otherwise compartmented roll is mounted in the overflow, and stock passing this point is metered by the speed of rotation of the roll. 3 figures. W.B.W.

## MACHINERY—VATS

TROTMAN, WILLIAM E. K. Cylinder mold for use in paper-making. U. S. patent 2,669,910. Filed Aug. 8, 1950. Issued Feb. 23, 1954. 9 claims. [Cl. 92-43]

A cylinder-mold construction is claimed in which the usual wire-supporting bars and wire winding are replaced by grooved T-bars; the grooves and slots in the bars leave numerous small supporting areas sufficiently closely spaced to eliminate the need for auxiliary wires underneath the cover wire. These grooved T-bars are held in position by means of rings mounted on the central shaft, providing a rigid roll construction. 8 figures. W.B.W.

## MATERIALS HANDLING

BINA, STANLEY J. Portable large roll holder and cutter. Canadian patent 499,799. Filed July 18, 1952. Issued Feb. 9, 1954. 2 claims.

A hand truck on which a large roll of wrapping paper is rotatably mounted incorporates a cutter bar to facilitate removal of the desired amount of paper from the roll. The unit represents a useful means for transporting rolls to certain wrapping operations, such as boxcar lining and the like. 7 figures. W.B.W.

PEARSON, HERSCHELL R. Log loading boom. U. S. patent 2,670,177. Filed April 7, 1951. Issued Feb. 23, 1954. 4 claims. [Cl. 254-184]

The boom design for a log-handling crane incorporates a separate, power-multiplying winch system operated by the winder drums on the crane. The winch system, coupled with the overhead supporting cable rigged to the boom enables the crane to handle heavy logs without danger of tipping. 10 figures. W.B.W.

## MOLDED PULP ARTICLES

PERRY, EUGENE L. Corrugated packing sheet. U. S. patent 2,668,786. Filed June 22, 1949. Issued Feb. 9, 1954. 1 claim. Assigned to Packaging Materials Corp. [Cl. 154-55]

A molded-pulp packing sheet is formed on a corrugated cylinder mold, then passed between scoring rolls during the drying stage to make the sheet flexible in both directions. 4 figures. R.A.S.

RUSSELL, HENRY R. Egg carton. U. S. patent 2,668,652. Filed May 19, 1948. Issued Feb. 9, 1954. 2 claims. Assigned to General Package Corporation. [Cl. 229-15]

Modifications in the molded-pulp egg carton which consists of three hingedly connected sections, comprising two cellular bodies and a tray-shaped cover, provide easier opening by adhesively sealing the cover to the top cellular body and incorporating a line of weakness between the two cellular sections. 6 figures. R.A.S.

## PACKAGING

GOLDEN, SAMUEL. Greeting card package and display container. U. S. patent 2,670,074. Filed Oct. 24, 1952. Issued Feb. 23, 1954. 4 claims. [Cl. 206-45.31]

A package for a set of greeting cards is constructed from cardboard with openings in the front and rear walls covered with a transparent synthetic plastic resin. The cover of the first card is viewed through the front opening, with a second card folded to expose the message through the rear opening. 6 figures. R.A.S.

## PAPER—COATED

CARSON, CLARENCE M. Coated rubber hydrochloride product. U. S. patent 2,650,174. Filed Dec. 6, 1951. Issued Aug. 25, 1953. 2 claims. Assigned to Wingfoot Corporation. [Cl. 117-139]

A heat-sealable, water- and vapor-resistant coating applicable to paper, glassine, foil, or the like is made by dissolving a mixture of rubber hydrochloride, chlorinated rubber, and paraffin or microcrystalline wax in solvents such as benzene and toluene. The viscosity of the coating solution may be adjusted to give the desired degree of penetration into a porous sheet. W.B.W.

SCHWEFSKY, MELVIN. Method of forming multicolor coating composition. U. S. patent 2,658,002. Filed Aug. 2, 1950. Issued Nov. 3, 1953. 4 claims. Assigned to United Lacquer Mfg. Corp. [Cl. 106-170]

A coating composition in which the colors remain in particulate form is produced by mixing the lacquer base (heated between 45 and 70°C.) with the color in the presence of a heated aqueous methylcellulose composition; the agitation is regulated to control the particle size desired. The methylcellulose (I) content of the mixture is insolubilized by the addition of glyoxal in amounts equal to that of (I). This mixture may be applied to paper, fiberboard, or the like by spraying or other means and dries in approximately two to four hours, leaving a continuous decorative and protective coating of multicolor design. W.B.W.

## PAPER—COATED (WRINKLE COATING)

TOULMIN, HARRY A., JR. Composition for producing wrinkle-textured films. U. S. patent 2,670,337. Filed July 9, 1951. Issued Feb. 23, 1954. 1 claim. Assigned to New Wrinkle, Inc. [Cl. 260-31.2]

Various thermoplastic resins dissolved in solvents with a high rate of evaporation are applied as coatings to a base of metal, paper, glass, wood, etc. and dried by differential heating (preferably by infrared radiation) to produce a wrinkled finish. W.B.W.

WALDIE, WILLIAM A. Production of a fluorescent and iridescent wrinkle-finish coating containing a hydrous iron oxide as pigment. U. S. patent 2,668,799. Filed Aug. 1, 1949. Issued Feb. 9, 1954. 2 claims. Assigned to New Wrinkle, Inc. [Cl. 260-22]

A coating composition comprising any suitable wrinkling alkyd or varnish base is applied as a fine spray, brushing, dipping, or the like. Hydrous iron oxide is the primary pigment and is generally added in concentrations of from 0.5 to 5%; shading pigments may likewise be added without detracting from the appearance of the finish. 1 figure. W.B.W.

## PAPER SIZING

KERR, RALPH W., and KATZBECK, WALTER J. Cold water dispersible starch sizes and process of making them. U. S. patent 2,669,523. Filed Aug. 28, 1952. Issued Feb. 16, 1954. 14 claims. Assigned to Corn Products Refining Company. [Cl. 106-213]

Starch which is readily dispersible in cold water is made by suspending the starch in water; oxidizing with an agent such as sodium hypochlorite, a peroxide, persulfate, or similar material; washing the oxidized product; adding from 3 to 7% (based on the weight of the starch) of boric acid; and gelatinizing and drying it, preferably in a heat-exchange device of the "Votator" type (*cf.* U. S. reissue patent 22,519, granted to Miller and Bevarly, July 18, 1944). W.B.W.

## PAPER SPECIALTIES

BANES, FRED W., and ARUNDALE, ERVING. Copolymers of dimethyl itaconate and conjugated diolefins. U. S. patent 2,619,477. Filed May 7, 1949. Issued Nov. 25, 1952. 13 claims. Assigned to Standard Oil Development Company. [Cl. 260-32.8]

Dimethyl itaconate polymerized with a conjugated diolefin such as butadiene-1,3 at elevated temperature and pressure and in the presence of a peroxygen compound catalyst produces a material which may be cast in thin films suitable for laminating to paper, wood, or cloth. The films possess excellent grease and oil resistance. W.B.W.

BUNZL, HUGO. Smoke filter wads. Canadian patent 499,668. Filed Jan. 5, 1950. Issued Feb. 2, 1954. 6 claims. Assigned to Cigarette Components Limited.

Material for cigarette filter wads composed of bleached cotton, cotton waste, or disintegrated cellulose is fed from a carding roll (or similar device) as a thin loosely coherent web onto a web of creped paper, and the two layers are wound together on the take-up reel for further processing. 2 figures. W.B.W.

CHRISTMAN, PAUL. Wallboard tape. U. S. patent 2,667,822. Filed Sept. 6, 1951. Issued Feb. 2, 1954. 2 claims. Assigned to Bemiss-Jason Company. [Cl. 93-1]

Wallboard joint tape for dry-wall construction is made by passing a strip of calendered paper tape between a series of rolls where it is successively pricked with a pattern of small holes and sanded to remove the protuberances caused in the first operation; the edges are beveled or skived to about half the thickness of the body of the tape, and the finished tape is rewound. 10 figures. W.B.W.

HAEGELE, OTTO P. Paper article of headwear. U. S. patent 2,669,725. Filed Sept. 1, 1950. Issued Feb. 23, 1954. 2 claims. Assigned to White Castle System, Inc. [Cl. 2-197]

A disposable paper cap embodies a heavy paper band and an accordion-pleated crown sheet of lighter paper such as a tissue paper; the band and crown sheet are joined in such manner as to be adjustable for various head sizes. 12 figures. R.A.S.

MALLABAR, HERBERT J. Manufacture of decorative laminae. U. S. patent 2,668,124. Filed Oct. 31, 1951. Issued Feb. 2, 1954. 6 claims. Assigned to Oxford Corporation. [Cl. 117-15]

Cover paper (preferably of open porous structure) for application to plasterboard, fiberboard, and the like is coated with pigmented fillers or dyes, dried, printed with a suitable pattern as by a rotogravure process, and passed through an impregnating bath where phenol-formaldehyde or a melamine resin is added; the web is dried at a temperature below that required for reaction of the thermosetting resin. This finished sheet is applied to the backing by heat and pressure. 3 figures. W.B.W.

NEWMAN, DOUGLAS A. Planographic plate and method of making same. U. S. patent 2,655,101. Filed Dec. 22, 1945. Issued Oct. 13, 1953. 34 claims. Assigned to Columbia Ribbon and Carbon Manufacturing Company, Inc. [Cl. 101-149.2]

A planographic printing plate is made from a paper-base sheet with high wet strength and low water-absorptive capacity. Several coatings of a low-viscosity carboxymethylcellulose are applied, and the sheet is dried and calendered between coatings. The rear surface is given a coating of Styron or other waterproofing composition; it is claimed that plates so treated are capable of printing a large number of copies without smudging, stretching, etc. W.B.W.

PETTOROSSI, JOSEPH. Decorative article. U. S. patent 2,668,385. Filed Nov. 1, 1951. Issued Feb. 9, 1954. 1 claim. Assigned to Paper Novelty Manufacturing Company. [Cl. 41-11]

Collapsible decorative articles (e.g., Christmas bells) of sandwich construction formed in two identical halves on a reinforcing base expand into two identical structures held together by the base. 4 figures. R.A.S.

PODGURSKY, JOHN. Receptacle for filing papers. U. S. patent 2,669,381. Filed July 26, 1949. Issued Feb. 16, 1954. 3 claims. [Cl. 229-77]

A combination file folder and mailing envelope is made of a centerfolded blank of manila paper with tabs and locking slots on the open edges for closure. Marginal edges may also be adhesively coated. 12 figures. R.A.S.

POPPE, GEORGE W. Paper bag having flap with reinforced locking tongue and ticket retainer. U. S. patent 2,669,382. Filed April 29, 1952. Issued Feb. 16, 1954. 6 claims. Assigned to Equitable Paper Bag Co. Inc. [Cl. 229-84]

A foldable locking tongue is formed from a double thickness of the flap section of a conventional flat paper bag; this tongue, when locked in closed position, and lines of severance cut in the bag flap secure a ticket strip, memorandum, or the like in view on the front of the bag. 13 figures. R.A.S.

SCHLIENZ, RALPH W. Paper package and method of manufacture. U. S. patent 2,668,769. Filed Sept. 27, 1951. Issued Feb. 9, 1954. 5 claims. Assigned to Riegel Paper Corporation. [Cl. 99-171]

Paper envelopes or pouches to hold pulverulent material or various small

articles are produced from two continuous webs of paper stock consisting of portions of different width overlapped and heat sealed or bound with thermoplastic adhesive. This joined web is folded lengthwise and the three margins are similarly sealed; the original overlap provides the opening flap. 10 figures. R.A.S.

SCHRAMM, AUGUST F., JR. Method of making a bonded permeable article. U. S. patent 2,668,787. Filed Jan. 9, 1951. Issued Feb. 9, 1954. 6 claims. [Cl. 154-92]

Fabric, paper, felt, or the like is made water repellent without blocking vapor passage through the material by dusting finely divided thermoplastic resin on the moistened surface, then consolidating the resin particles with the base material by the application of heat and pressure. The resin particles are thus bonded to the backing and formed into a thin discontinuous film surface. 7 figures. W.B.W.

SPITZ, ISIDOR. Composite packaging or wrapping material and manufacture thereof. U. S. patent 2,669,258. Filed Sept. 14, 1948. Issued Feb. 16, 1954. 10 claims. Assigned to American-National Bag & Burlap Co., Inc. [Cl. 138-55]

A bag material combining product protection with wear resistance is made from a strip consisting of an inner layer of crinkled or creped paper and an outer layer of cloth or burlap stitched or adhesively secured in a spirally wound tube wherein only the edges are secured and the other portions are free to move relative to each other. 9 figures. R.A.S.

TAYLOR, NELSON W., and CLARK, BRYCE L. Heat-sensitive copying-paper. U. S. patent 2,668,126. Filed Jan. 5, 1950. Issued Feb. 2, 1954. 4 claims. Assigned to Minnesota Mining & Manufacturing Company. [Cl. 117-36]

A coating material embodies infusible particles (in the example, glass beads from 3 to 4 mils in diameter are used) mixed with particles of a fusible waxy material with a melting-point range between 70 and 120°C. (e.g., carnauba wax, cadmium stearate) and a binder such as ethylcellulose or cellulose acetate to bind the coating to the paper or nonfibrous film backing. In making a copy of a typewritten page, the coated copying paper is placed in close and heat-conductive contact with the unprinted surface of the page. The presence of the infusible particles aids in preventing adherence of the copying sheet to the original when exposed to intense radiant energy and also reduces the cost of the coating. 1 figure. W.B.W.

TROY, ARNOLD I. Disposable filter and holder. U. S. patent 2,669,995. Filed April 28, 1950. Issued Feb. 23, 1954. 9 claims. [Cl. 131-10]

A combined holder and filter for cigarettes, cigars, and pipes is achieved by winding a strip composed of layers of metal foil (preferably aluminum) and an absorbent paper, and positioning in an outer cylindrical sheath; either layer may be crinkled or grooved to provide passages for the smoke. 5 figures. R.A.S.

## PLASTICS—FIREPROOF

BIERLY, LESTER A. Flame resistant compositions. U. S. patent 2,669,521. Filed April 17, 1948. Issued Feb. 16, 1954. 17 claims. Assigned to Diamond Alkali Company. [Cl. 106-15]

Moldable thermoplastic materials such as cellulose acetate butyrate or polystyrene are made fire resistant by the incorporation of plasticizers which may include phosphoric acid derivatives or chlorinated paraffin with about 40% chemically combined chlorine. W.B.W.

## PRESERVATIVES

MOYLE, CLARENCE L. Bis(2-hydroxy-α-methylbenzyl) benzenes. U. S. patent 2,634,297. Filed Feb. 18, 1952. Issued April 7, 1953. 4 claims. Assigned to The Dow Chemical Company. [Cl. 260-619]

Compounds of this class may be prepared either by reaction of chlorophenol with di(α-chloroethyl)benzene in the presence of zinc chloride or by the direct chlorination of bis(2-hydroxy-5-chloro-α-methylbenzyl)benzenes. The compounds are oily liquids or soft solids substantially insoluble in water and possess strong bactericidal properties useful as preservatives in paper, textiles, or leather goods. W.B.W.

## PRINTING AND PRINTER'S INK

VAN WIRT, ALFRED E., and JONES, GEORGE F. Pigment paste. U. S. patent 2,656,327. Filed Oct. 30, 1948. Issued Oct. 20, 1953. 1 claim. Assigned to Imperial Paper and Color Corporation. [Cl. 260-29.4]

An aqueous pigment paste useful for printing on cloth, leather, paper, etc. with excellent washability, light resistance, stability, and smudge resistance is prepared by combining anionic pigment and resin dispersions with a cationic thermosetting resin. For most purposes, urea- or melamine- formaldehyde resins are preferred. W.B.W.

## SHIPPING CONTAINERS

BAXTER, JAMES C., and FRENCH, JOHN H. Shipping tube with integral end closure. U. S. patent 2,670,129. Filed March 24, 1950. Issued Feb. 23, 1954. 3 claims. [Cl. 229-93]

This is identical with Canadian patent 499,265 (Jan. 19, 1954); *cf.* B.I.P.C. 24: 597. 6 figures. R.A.S.

GLEASON, AUGUSTUS W., and BOWLES, HENRY M. Folded end-panel carton. U. S. patent 2,670,127. Filed June 8, 1950. Issued Feb. 23, 1954. 4 claims. Assigned to California Research Corporation. [Cl. 229-37]

A regular hexagonal carton formed from a single sheet of heavy paperboard or the like is closed by the flaps which are extensions of the side walls, alternate flaps folding inwardly and the upper flaps fastened by an interlocking notch and stapled if desired. This container is especially suitable for packaging hot asphalt. 4 figures. R.A.S.

STOREY, ALVIN B. Cartons. Canadian patent 500,153. Filed Jan. 22, 1951. Issued Feb. 23, 1954. 4 claims. Assigned to Celanese Corporation of America.

A carton for yarn packages or finished fabrics contains an upper and lower cover section and a pair of U-shaped liners arranged at right angles to each other. The upper cover telescopes over the liner and abuts the upper edge of the lower cover. Adhesive banding at the joint between the covers or metal banding or the like is used to close the carton. 5 figures. W.B.W.

## SHIPPING CONTAINERS—MULTIWALL BAGS

JONES, TOM L. Valve bag. U. S. patent 2,668,003. Filed June 3, 1950. Issued Feb. 2, 1954. 4 claims. Assigned to Arkell and Smiths. [Cl. 229-62.5]

An improved valve construction for multiwall bags with pasted ends is claimed; a transverse slit is made in the side flaps, and an end flap of one of the inner plies is elongated to serve as a guide to carry the filling nozzle under the side flaps and provide a more effective valve closure. 4 figures.
R.A.S.

## SULFITE PROCESS—SODIUM BASE (ACID)

GRAY, KENNETH R., CROSBY, HARTZELL L., and STEINBERG, JOHN C. Recovery of chemicals in wood pulp preparation. Canadian patent 499,736. Filed May 29, 1951. Issued Feb. 2, 1954. 17 claims. Assigned to Rayonier Incorporated.

Spent cooking liquors from a soda-base sulfite process and an alkaline process are combined prior to evaporation and burning. The dissolved smelt after combustion is alternately carbonated (flue gas may be used for this purpose) under pressure and steam-stripped in a partial vacuum, the above reaction causing the formation of carbonate and bicarbonate followed by the removal of hydrogen sulfide. Recovered hydrogen sulfide may be oxidized to sulfur dioxide. Depending upon the final product desired, the carbonate solution resulting from the above treatment may be used in that form, converted to caustic soda by causticization, or treated with sulfur dioxide to produce sodium sulfite. 1 figure. W.B.W.

GRAY, KENNETH R., CROSBY, HARTZELL L., and STEINBERG, JOHN C. Recovery of chemicals in wood pulp preparation. Canadian patent 499,737. Filed May 29, 1951. Issued Feb. 2, 1954. 9 claims. Assigned to Rayonier Incorporated.

This is similar to Canadian patent 499,736 (Feb. 2, 1954; *cf.* abstract above) except that a single carbonation at a pressure from 20 to 165 p.s.i. and a temperature varying from 50 to 150°C. is followed by a single steam stripping of the hydrogen sulfide from the liquor under a vacuum of from 5 to 29 inches of mercury. 1 figure. W.B.W.

GRAY, KENNETH R., CROSBY, HARTZELL L., and STEINBERG, JOHN C. Treatment of alkali metal sulfide solutions. Canadian patent 499,738. Filed May 29, 1951. Issued Feb. 2, 1954. 7 claims. Assigned to Rayonier Incorporated.

Carbonation of the sulfide-containing liquors (*cf.* Canadian patent 499,736, abstract above) by successive stages involving carbonation under pressure and increased temperature followed by stripping of the hydrogen sulfide gas from the liquor by steam at reduced pressure is claimed. 1 figure.
W.B.W.

## SULFITE WASTE LIQUOR

ZIMMERMANN, FREDERICK J. Waste disposal. U. S. patent 2,665,249. Filed March 27, 1950. Issued Jan. 5, 1954. 9 claims. Assigned to Sterling Drug Inc. [Cl. 210-2]

The oxidation of waste effluents such as spent sulfite liquor, kraft liquor,

Masonite liquor, sewage, cheese plant whey, or any waste effluent containing organic matter is accomplished by the introduction of a heated oxidizing medium (e.g., compressed air) under pressure of 1500 p.s.i. into a tank or tanks containing the waste material heated to the point (usually between 480 and 625°F.) at which oxidation will take place. In the self-sustaining process, heat recovery from the unit is claimed to be as high as 95% of the theoretical value in the material, thus producing power in excess of that required for the processing. The completely oxidized effluent is drawn off into a flash chamber from which the gases and steam are bled at a pressure of 1500 p.s.i. W.B.W.

## TALL OIL

ARCHIBALD, FREDERICK R. Methods of preparing flotation reagents. U. S. patent 2,669,545. Filed July 5, 1951. Issued Feb. 16, 1954. 5 claims. Assigned to United States Steel Corporation. [Cl. 252-61]

A flotation agent for collecting siliceous mineral particles is prepared by passing a mixture of a fatty acid material (such as tall oil) and sodium silicate through a column containing acid-type, ion-exchange resins (Amberlite 1R-100H). W.B.W.

CARPENTER, JOSEPH E. Condensation products of higher fatty acids, polyalkylene polyamines, and organic halides. U. S. patent 2,668,165. Filed Dec. 22, 1951. Issued Feb. 2, 1954. 18 claims. Assigned to American Cyanamid Company. [Cl. 260-97.5]

Water-dispersible, cationic, surface-active agents useful in the textile, lubricating, flotation, and allied fields are produced by reacting a fatty acid or mixture of fatty acids (such as tall oil) with an organic halide (e.g., methyl iodide, trimethyl bromhydrin, ethylene chlorobromide, etc.) and a polyalkylene polyamine such as diethylene triamine, dipropylene triamine, or the like in either the refined or the crude form. The condensation is carried out at a temperature between 120-300°C. W.B.W.

## TEXTILE INDUSTRY AND FABRICS—FIREPROOFING

DAHLSTROM, ROY, and BRONSON, GEORGE E. Method for the production of a fire retardant solution. U. S. patent 2,670,297. Filed May 31, 1951. Issued Feb. 23, 1954. 5 claims. Assigned to National Lead Company. [Cl. 106-15]

The preparation of a fireproofing solution for cellulosic materials containing antimony trioxide and titanium tetrachloride and sufficiently stable to withstand storage over extended periods of time is claimed. W.B.W.

DILLS, WILLIAM L. Process for flameproofing textile materials. U. S. patent 2,668,784. Filed Sept. 4, 1951. Issued Feb. 9, 1954. 6 claims. Assigned to E. I. du Pont de Nemours and Company. [Cl. 117-138]

A flame- and glowproofing composition which may be used to treat textile yarns on the spool or core without leaving oxide deposits on the fiber is produced by dissolving titanium and antimony oxides in an acidic aqueous solution which also contains an organic solvent such as methanol or isopropanol. W.B.W.

MALOWAN, JOHN E., and HURLEY, FORREST R. Fireproofing compositions and method for making same. Canadian patent 499,722. Filed Sept. 9, 1950. Issued Feb. 2, 1954. 5 claims. Assigned to Monsanto Chemical Company.

A flame- and glowproofing composition is prepared by reacting phosphoryl chloride dissolved in an inert solvent with ammonia to give a product having a neutral or slightly alkaline reaction. This is the same as U. S. patent 2,596,935 (May 13, 1952); *cf.* B.I.P.C. 22: 800. W.B.W.

## WAXES

HUNTER, MELVIN V., and SEGESSER, JOHN R. Low melting paraffin wax. U. S. patent 2,670,323. Filed Jan. 6, 1951. Issued Feb. 23, 1954. 6 claims. Assigned to California Research Corporation. [Cl. 196-149]

Paraffin wax with a melting point between 125 and 135°F., high tensile strength, and well suited for use in paper milk cartons is produced by mixing from 20 to 35% of a nonstraight-chain distillate paraffin having a molecular-weight distribution between 350 and 525 with a straight-chain distillate paraffin wax in the melting-point range of 127-140°. W.B.W.

## WET STRENGTH

WALKER, JOSEPH F., and KOKOWICZ, STANLEY E. Cross linking. U. S. patent 2,548,455. Filed July 20, 1949. Issued April 10, 1951. 10 claims. Assigned to E. I. du Pont de Nemours & Company. [Cl. 260-233.3]

The cross linking of starch or cellulose materials such as paper, wood, cotton, or regenerated cellulose by treatment with 2,5-dimethoxytetrahydrofuran (I), then hydrolyzing (I) to succinaldehyde, is claimed. Addition of 4% of (I) to paper in the presence of an acid catalyst raises the wet strength to 70% of the dry tensile strength of the sheet. Cornstarch paste prepared by adding 3% of (I) to the slurry while heating is claimed to increase water resistance of the seals made with this adhesive. W.B.W.

# Book Reviews

HALL, COURTNEY ROBERT. History of American industrial science. New York, Library Publishers [c1954] 453 p.

According to the statement on the cover "this work will be of immense importance to students who envision a business career, to those who take pride in the organizations for which they work, to business men and industrialists, as well as to the general reader who wishes to discover what makes America tick." This reviewer unfortunately read Chapter 10 on Pulp, Paper and Print first. He found the historical handling of the industry well written and probably fairly accurate, but his interest both in the chapter and book waned as he read the author's interpretation of the industry's technology and found it to be a curious mixture of accuracies and inaccuracies. This (the interpretation) seemed to be leveled not in any "bold and original" manner "at business men and industrialists" but at a reading public of tender age. Furthermore, the description of the process leaves the reader with mistaken impressions of the pulp- and papermaking process and its ramifications. A few illustrations—chemical pulp is not made because of the scarcity of spruce for conversion into mechanical pulp as might be inferred from page 277. Chemical pulps have uses for which mechanical pulps are unsuited. The description of papermaking as a process of "feeding" pulp as a *"soggy mess"* into a paper machine which is described as a "massive series of machines about a city block in length" with the wet sheet "passing through forty or fifty steam heated cylinders" to emerge as "an enormous roll" will certainly fail to thrill businessmen and industrialists in the paper industry who have a feeling of pride in the accomplishments of their industry, nor will it enlighten "students who envision a business career" in the pulp and paper industry. The description of the woodroom in a mechanical pulp mill as a place where barked logs "are cut up into blocks" before being ground is an inaccurate description of what takes place in the woodroom of such a mill as the Great Northern Paper Company at Millinocket, Maine as it prepares the wood for conversion into 700 tons of mechanical pulp every 24 hours. In view of his reaction as he read Chapter 10, the reviewer read the rest of the book rapidly for its interesting description of the historical development of industry and skipped "the interpretation of a wide variety of concise facts" as these dealt with the "inter-relationship of scientific research and industrial management." This may lead to an unfair appraisal of what may be a valuable book, but in these days there is no excuse for a misleading, inaccurate, or fuzzy statement of such an important industrial process as that of making paper. H. F. Lewis

TOBOLSKY, ARTHUR V., and MESROBIAN, ROBERT B. Organic peroxides, their chemistry, decomposition, and role in polymerization. New York, Interscience Publishers, 1954. 197 p.

The first section of this book is intended as an elementary guide to the organic chemistry of peroxides; it gives a thorough treatment of the preparation, properties, and structural classification of these compounds, which are of great importance as initiators of addition polymerizations. The second section deals with the physicochemical aspects of the cleavage of peroxide molecules, particularly di-*tert*-butyl peroxide and benzoyl peroxide. In a short third section, the initiation of homogeneous vinyl polymerization by peroxides is discussed in detail. As appendixes, lists of physical constants of selected organic peroxides, explosive peroxides, and commercially available peroxides are given. The book is principally a compilation of previously published information conveniently arranged in one place; it is probably of greater interest to the organic chemist than to the high-polymer chemist. The reader will find a large number of references to publications in both fields.

Peter Dahm

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